THE JOURNAL OF NEUROLOGY AND PSYCHOPATHOLOGY.

Vol. VII. OCTOBER, 1926. No. 26.

Original Papers.

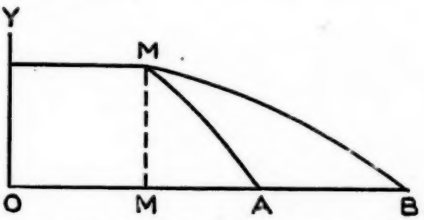
FATIGUE: A CLINICAL STUDY.

By R. D. GILLESPIE, London.*

INTRODUCTION.

There is no satisfactory definition of fatigue. It has been defined as a "diminished capacity for work." But there are objections to this, for it postulates a knowledge of previously existing capacity; and, further, a diminished capacity is not always synonymous with fatigue, there being other causes of such diminution. Again, one may be fatigued and the capacity for work diminished, and yet as long as activity is in abeyance, as in lying recumbent, fatigue may not be felt. Moreover, a person subjectively fatigued may be apparently capable of normal output per unit time, for example, on an ergometer.

If the time in hours is represented by the abscissa and the work in kilogrammetres by the ordinate, and if the total work of which the organism is capable is represented by OBY when work is commenced from complete rest, while OA represents the time for which the organism can work if it starts with a certain amount of fatigue, then it sometimes happens that for a time OM the output will be normal:—



* Henderson Research Scholar in Mental Diseases. From the Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore, and the Cassel Hospital.

Fatigue may have been previously felt, but becomes apparent only with prolongation of the work beyond M, when a falling off in output occurs earlier than if the subject had not been fatigued in the beginning. The difference in the two areas OYB and OYA represents the amount of fatigue with which the subject started (supposing OYB to represent the amount of work of which the same subject, unfatigued, is capable).

It is evident that the definition of fatigue as a diminished capacity for work has the disadvantage of being *a priori*, since only by working to the point of exhaustion can the fatigue be fully demonstrated.

CLINICAL DEFINITION.

As we are concerned only with the clinical side at present, the following formula is convenient :—

A person is fatigued when he is capable of less general activity than is usual with him, or when he is capable of less activity than would be expected from his general mental and physical equipment ; and when the diminution in activity is accompanied by a sensation of fatigue, or of exhaustion, or of weakness.

A succinct behaviouristic but evasive definition given by Janet[1] is as follows :—

Fatigue is the behaviour of a man at rest. The sensation of fatigue is the desire for that behaviour.

METHODS OF INVESTIGATION.

Fatigue manifests itself subjectively and objectively, and as an objective phenomenon it lends itself to clinical and presumably also to laboratory investigation. In each of these ways, two broadly differentiated methods are available, the method of performance of the whole organism or a part of it, and the method of observation of isolated phenomena, such as tremor, or the reaction of the blood.

Clinically, performance is simply what the individual does in his daily life. From the laboratory viewpoint, performance may be gauged from the output of work under controlled conditions (*e.g.* in factories), or by using an ergograph (to record contractions of individual muscles or by adding sets of figures). It is claimed by some (*e.g.* Creuze[2]) that in fatigued subjects the ergographic curve of the finger flexors falls off more rapidly than is normal, and that in adding figures certain fatigued persons diminish rapidly in their performance from the start.

CLINICAL VARIETIES.

Three clinical varieties of fatigue are recognisable. The first is the so-called ' constitutional ' type. The second group we shall deal with later. The third group consists of those who are fatigued as the result of organic disease ; the asthenia of cerebellar disease is a well-known example (however

it may be caused; by lack of support from the cerebellar arc with its 'avalanche' properties?). An early sign of disseminated sclerosis may be excessive fatiguability of the lower limbs.

The best general description of the non-organic clinical types in which fatigue is an outstanding feature is 'irritable weakness,' not infrequently designated 'neurasthenia.' The cases belonging strictly to this group are comparatively few in number, and there are many other clinical settings in which fatigue appears, as we shall see. It is round 'neurasthenia,' however, that most discussions of the causes of fatigue as it occurs clinically have centred.

The credit of first describing in detail and naming the disorder 'neurasthenia' belongs to an American, Beard,[3] who wrote considerably on the subject from 1880 onwards. For a time neurasthenia was known as the "American disease" (as indeed Beard himself appears to have named it). But it was not long before European physicians began to describe it, and by 1894, just 14 years after Beard first drew attention to the syndrome, a diligent German[4] was able to collect 15 closely-printed pages of bibliography. The credit of first describing the condition as a clinical entity, although he did not name it, belongs to Robert Whyte[5], of Edinburgh, who in 1765 distinguished it from "hysteria" and "hypochondria." This is probably a proper distinction, which many of his successors have failed to observe. Frequently in modern writings such disorders as anxiety neurosis, hysteria and psychasthenia are included under the heading 'neurasthenia.' Some authors do not admit any fundamental distinction. For Janet[10] 'neurasthenia' is frequently an early stage of psychasthenia, and his case descriptions of 'neurasthenia' include many psychasthenic symptoms. The following table, modified from Cobb,[6] shows how the classification has changed:—

Symptoms.	*Beard.*	*Early French School.*	*Modern French School.*	*Psychopathology of Freud, etc.*
Physical fatigue ('irritable weakness') ..	Neurasthenia		Neurasthenia.	Neurasthenia.
Gastrointestinal disturbances		Neurasthenia.	Indefinite disturbances.	Anxiety neurosis.
Headache				
Vague pains				
Obsessions		Many terms used for many different symptom groups, *e.g.*, 'folie de 'doute.'	Psychasthenia.	Obsessive compulsive psychoneurosis.
Phobias				
Anxiety				

According to Burr,[7] in Osler and McCrae's *System*, neurasthenia is a "really existing thing," a condition of pathological weakness without discoverable lesion, showing itself by too rapid and too great fatigue, physical or mental, or both; emotional imbalance; and undue irritability (too great response to stimuli) of the nervous system.

ETIOLOGY OF FATIGUE SYNDROMES.

The theories advanced for the etiology of fatigue syndromes can be conveniently classed in five divisions: constitution, autointoxication, excessive effort, emotion, and the psychoanalytic theories.

I. *Constitution.*—There are individuals who from a very early age show signs of 'irritable weakness.' What this depends on, is unknown. But as there are certain individuals with metabolic disorder, e.g. alkaptonuria, and others who at an early age show gross defects in the motor system, for example the myotonias and muscular dystrophies, it is not unreasonable to suppose that there may be other inborn defects of function showing themselves only in their remote effects of early fatigue and of irritability.

With inborn deficiencies, there arises the question of inheritance. According to some authors, heredity plays no part, while others state that heredity is the essential factor in a certain class of case—"Primary neurasthenia" as described by Osler and McCrae.

Alcoholism and tuberculosis are said to predispose to neurasthenia in the offspring (Tredgold[8]) by those who believe in the vitiation of the germplasm by parental toxic influence (cf. Stockard[9]). Our own observations show that persons prone to fatigue have, in a high proportion of cases, nervous or mental disorders in their immediate ancestry.

There is some evidence that physical constitution plays a rôle. The so-called asthenic type, with long narrow thorax, long neck and limbs, small muscles and visceroptosis, is traditionally predisposed to show irritable weakness.

II. *Autointoxication.*—This hypothesis is apparently supported by the frequency of gastrointestinal troubles in fatigued subjects. "Crises of fatigue" (Janet[10]) may be preceded by considerable disturbance of this kind, but it is more plausible to regard the fatigue and these disturbances as of common origin. No one has succeeded in demonstrating an endogenous toxin in so-called autointoxication of any kind, except in complete gastrointestinal obstruction (Gerard[11] and Felty[12]).

III. *Excessive effort* (*'overwork'*). (1) *Theoretical views.*—Formerly this theory was widely held, and on it a well-known method of treatment (Weir Mitchell's) was based. The theory was founded very largely on the statements of the patients themselves, who usually complained of overwork. Deschamps,[13] an exponent of this hypothesis, defined fatigued subjects as those who tire easily and take abnormally long to recover. He regarded the cerebrum and medulla as "accumulators of energy," and attributed to the vagosympathetic a "sthenogenic" function. To derangement of this sthenogenic function, or to a disproportion between the needs and the quantity of energy directly available, asthenia is to be attributed, according to Deschamps. All this is obviously a matter of mere words.

Janet[1] would have it that in fatigued subjects there is insufficient energy to produce the tension or potential which he supposes necessary for the highest, *i.e.* most integrated, functions.

Views of the type above described have been widely contested. Dubois,[15] for example, remarks, "You will find only a trace of true fatigue, amid a huge mass of autosuggestion of fatigue." For him, evidently, it is a matter of conviction of fatigue and weakness following on some slight actual sensation. But Babinski[16] and Dagnan Bouveret point out that the essential symptoms of 'irritable weakness' do not disappear on suggestion. Münsterburg[17] thought there was an enormous exaggeration in the language of neuropaths who considered themselves overworked. Dejerine[18] admits that a few cases may be as Deschamps claims, but that the majority suffer from an *idée fixe*—a constant autosuggestion. "The patient has it in his head that he cannot walk without fatigue for more than ten minutes and he awaits the end of the ten minutes with anxiety." (But if there is an admixture of anxiety, it is not 'neurasthenia' in pure culture.)

As contributory factors in the production of fatigue (but not as essential ones, presumably) Janet[1] suggests certain exaggerations of movement, *e.g.*, walking too quickly without regulation of breathing, or holding oneself too rigidly, which gives a feeling of effort and evokes the idea of fatigue. Such disharmonies of action bring on more or less real fatigue, by attention to activities which would go on better automatically.

(2) *Experimental evidence.*—Experimental evidence of the production of prolonged irritable weakness by work alone, is lacking. It is rarely that conditions are created in which only overwork and nothing else is present. Nevertheless there is some evidence that excessive effort may temporarily release symptoms of various kinds. Thus Tissié[19] observed that certain bicycle riders after a six-day ride developed phobias and other psychasthenic phenomena. But the irritable weakness type of symptom is not mentioned in the record. Féré[14] stated that fatigue often provoked ideas of persecution. During the late war, airmen after prolonged flying were apt to show irritability and various fatigue symptoms[20]. This was associated with flying at high altitudes and consequently with oxygen deficiency.

The general conclusion is, that while it may produce transitory symptoms, excessive effort alone does not lead to a prolonged state of irritable weakness. Overwork in the non-predisposed subject tends to limit itself, the sensation of fatigue being a factor of safety which warns the subject to conserve his energy—a warning to which the normal being probably responds more readily than the anxious person. This is in accord with Janet's conclusion, who believes that in psychopaths fatigue animates symptoms; but this is different from supposing that fatigue is the cause of such symptoms.

IV. *Emotion.* (1) *Theoretical views.*—A close relation between emotion and fatigue has long been suspected. For Dejerine, the real cause of fatigue

lies in the emotional equipment. Creuze speaks of an "emotive constitution." Janet says that there is symptomatically little difference between emotion and fatigue, both being in his opinion psychological states of depression.

That profound emotions tend to be followed by fatigue or exhaustion is a matter of observation. Some hold that fatigue may be followed by a depressive emotion as a direct consequence. "Tristesse" for Creuze[2] "is simply the perception of external things through a temperament which suffers from a diminution of the various organic processes which constitute life—the 'tristesse' of the neurasthenic is a phenomenon of cœnæsthesis." This is, of course, a reminiscence of the James-Lange theory.

Sollier[21] believes that 'tristesse' is a feeling that the quantity of energy available is inferior to the normal average. A case of Janet's contradicts this, in that periods of extreme fatigue were accompanied by a feeling of well-being (in contrast to the patient's usual condition).

(2) *Clinical evidence.*—Much more important than theory is the evidence that may be obtained from clinical observation.

A. Meyer[22] points out the possibility of irritable weakness as a disappointment or failure reaction, and the connection with manic-depressive reaction-types, in which fatigue appears sometimes to replace depression. Some clinical evidence will be submitted below.

(3) *Experimental evidence.*—The theory of the etiological rôle of the emotions in the production of fatigue syndromes has now some experimental basis. It is fairly generally accepted that certain emotions, such as anger and fear, in animals, are associated with an increased output into the blood-stream of adrenalin. It is also known that adrenalin has a powerful effect in restoring contractile activity to muscle that is already fatigued.

An interesting illustration of the probable emotional basis of certain fatigue states occurred recently under conditions that were unusually well controlled. Two patients, male, of the same age (23), were subjected to an association experiment with the galvanometer. In this experiment 100 words, many of them of obvious emotional significance, were read to the patients and the galvanometer readings recorded. The same words were used with each patient, who had been living under the same conditions, in the same ward, for a number of weeks. Both were previously ignorant of the nature of the test. After it was over, one of them, after a latent period (of an hour or so) of rumination, lay down in bed, refused to get up, was irritable and threw his hat at the nurse. He remained silent when the physician saw him, but afterwards confessed that he had been much annoyed by the words of the test, and had concluded that his difficulties had been noised abroad. The other also lay down in bed, but complained only of being extremely fatigued, talked readily, and said that the test words had not troubled him, but that the strain of sitting still during the test had been far too great for him.

V. *Psychoanalytic theories.*—These are presumptively related to the theory of the emotional origins of fatigue, but they display a disconcerting and even contradictory diversity. Neurasthenia was held at one time by certain analysts, including Freud, to be the physical effect of excessive masturbation. Ferenczi[23] illustrates and seeks to support this thesis by instancing the effect of a single act of masturbation as a "one-day neurasthenia." But Ernest Jones[24] finds it necessary to add a moral conflict as an accessory factor. "Neurasthenia is only an exaggeration and fixation of the lassitude, fatigue and general slackness that supervene on a single act of masturbation performed after a moral conflict." Even this is not enough. Another stress is added. "There is always an underlying conflict against buried desires relating to sexual perversions, or incestuous thoughts." Thus Jones finds two conflicts necessary, one conscious and the other unconscious, as well as physical depletion, to account for 'neurasthenia.' Stoddart[25] is bolder, beginning where Jones left off; finding the physical part of the hypothesis unnecessary, he declares that neurasthenia is of entirely psychical origin, and is always due to completely or partially repressed autoerotism. For Stoddart, neurasthenia dates from the renunciation of masturbation. All these theories leave a difficulty which Stoddart faces by creating another group of "chronic nervous exhaustion" which is a "disease of middle life," usually traceable to some exhausting influence on the nervous system.

SYMPTOMATOLOGY.

The fatigue syndrome to which the name 'neurasthenia' has been characteristically applied included the following symptoms and physical signs: 'brain-fag' with sensations of pressure in the head; poor memory, lack of concentration, irritability of temper, increased reflexes, poor sleep, anorexia and various aches and pains (A. Meyer[22]). This syndrome is rarely met with alone, and the cases appended illustrate the occurrence of fatigue and its significance in a wide variety of conditions.

An examination of these cases shows that fatigue can occupy a very varying place, both in importance and in the chronological development of symptoms, in many different disorders. The cases have been divided into groups according to the symptomatic importance of the fatigue complained of, but in all of them the connection of fatigue with emotional disturbance is very close.

The cases seem to fall naturally into five groups.

(1) In this group fatigue is the direct expression of a conflict. The psychogenesis is fairly clear and fatigue is a principal, often the most important, symptom. (Cases 1 to 10.)

(2) Fatigue is here a prodromal symptom of serious mental illness. Even in these cases the fatigue can be referred to certain factors producing

a conflict. In them the conflict has not only produced fatigue (as is the case in the first group from which this one is not sharply to be distinguished), but has gone on to the production of psychotic symptoms. (Cases 11 to 14.)

(3) Fatigue simply accompanies other symptoms which together make a picture of a depression or of a schizophrenic psychosis. (Cases 15 to 19.)

(4) In one case the recurrent attacks of fatigue and their association with certain other symptoms suggested that here fatigue was a symptomatic equivalent to a recurrent depression. (Case 20.)

(5) Fatigue may be a sequel of a variety of mental disorders. (Cases 21 to 24).

GROUP I.—(Fatigue as a leading symptom.)

In the first group fatigue developed in a variety of settings and its meaning lay deeper in some cases than in others; but it was always the consequence of conflict, the significance of the symptom varying in importance with the depth of the conflict. Thus the conflict may involve a simple recent or contemporary situation as in Case 1, or result from a profound personality defect as in Case 2. In some instances fatigue represents disappointment—the reaction to failure following a long struggle for success, as in Case 5, which illustrates also the problem of overwork. It is another example of fatigue following not simply excessive work, but unsuccessful work. The supposed physical nature of the stress in this case (long hours without holidays) probably helped to condition psychologically the nature of the subsequent symptom, viz. fatigue, which is commonly considered to arise from physical causes. In Case 8, fatigue resulted from dissatisfaction, and in it also the position of fatigue as a leading symptom probably depended on the fact that the patient had found her chief outlet in physical exercise. In other words, the symptom occurred in the sphere in which sublimation had chiefly occurred and failed.

In other instances fatigue in one direction indicates diversion of interest into another. The lack of energy for farm-work shown in Case 3, was accompanied by absorption of the patient's interest in the erotic sphere.

The purpose which complaints of fatigue may have (unwittingly) is seen clearly enough in Case 4, where exhaustion enabled the patient to escape for the time being from a distasteful situation. In behaviouristic terms the fatigue was an avoidance reaction.

Sometimes fatigue is largely iatrogenic, as in Case 10. This patient was informed that she had heart-disease and pernicious anæmia. She consequently believed that she could do nothing with safety and slight sensations of fatigue assumed great significance, limiting her activity to an extreme degree.

In only two of these patients was there a special connection with masturbation (Cases 6 and 7) and in each of them it is the conflict that seems important.

GROUP II.—(Fatigue as a prodomal symptom.)

In four instances, the complaint of fatigue was important clinically to an unusual degree; for it was for a time the only symptom and the only overt expression of an acute conflict, and was the precursor of a serious type of mental disorder. In all four cases the apparently simple complaint of fatigue was followed by illnesses which, although none of them exhibited a clearly defined disease-picture, nevertheless had a very definite schizophrenic colouring. One case (13) is given for the sake of example.

GROUP III.

In this group fatigue was of secondary import. It accompanied affective depression or a schizophrenic psychosis. Fatigue and depression are so commonly associated that it seems reasonable to suppose that there is a close connection between the two. Of the five patients in the group, case 16 is given as an example.

GROUP IV.

Only one case is available to illustrate the point already suggested, viz. that fatigue may so dominate the symptom-complex as to eliminate altogether complaints of depression in what from other indications is in all probability a depressive psychosis. (Case 20.)

GROUP V.

In this group of four patients fatigue was the sequel of long-continued disturbances in which emotional causes played a prominent part. The cases support the general contention that where fatigue is complained of, emotional factors should be excluded before an entirely physical cause is assigned. Case 21 is quoted as an example.

In a previous study, the majority of these cases were examined in detail from the physical side, on the principles enunciated in a previous paper[26]. The following is a summary of the results obtained[27]:—

In a majority, there were inadequate postural response of blood-pressure and diminished exercise-tolerance. In a proportion of cases only the blood-pressure was lower and the pulse-rate more rapid at rest than in normal. The red-cell count, hæmoglobin and PH of the blood were always within normal limits. The vital capacity was below normal in 11 subjects, and breath-holding time diminished in 18. In one-third the fall in blood-sugar was abnormally delayed after glucose. The basal metabolic rate was abnormal in 6 of 9 subjects. Visceroptosis occurred in 4 out of 14. In two subjects the parasympathetic predominated, and in one the sympathetic was over-active. The irritability to pilocarpin, adrenalin and atropine was striking, most subjects being abnormally sensitive to one or other of them, and some to all three.

It is evident that to some extent the weakness and irritability which present themselves clinically are accompanied by functional weakness and irritability in the various organic systems—in the vagosympathetic, as shown by the irritability to drugs; in the cardiovascular system, as seen in the diminished cardiac reserve and the lability of the pulse-rate; in the anomalies of general and carbohydrate metabolism; and (more doubtfully) in the respiratory irritability (inability to hold breath) and lowered vital capacity.

TREATMENT.

From the above findings, several methods of treatment can be used, with some confidence in their foundations.

1. From the large part played by emotional reactions, it is evident that the principal rôle must be assigned to psychotherapy. This was used as the principal measure with success in a number of the above cases.

2. Exercise tolerance can be increased by graded exercises (cf. treatment of D.A.H. cases).

3. Hydrotherapy is useful in increasing the vasomotor tone and so helping the postural response of blood-pressure.

4. Exercises can be used to increase the vital capacity. The sugar tolerance is also raised by any form of exercise (as is known to be the case, within narrow limits, even in diabetics).

5. A traditional method of treatment by the administration of phosphates fell into disrepute because of its apparently faulty rationale, but, like a number of other empirical methods, it has now been shown to have a sound basis. German soldiers during the war were found to have their power of muscular endurance increased by the administration of phosphates[28]. Phosphate is built up into the muscle molecule as a glucose-phosphate, and the working power of the muscle prolonged.

These are the chief methods of treatment, but each case must in the first place be thoroughly examined physically and mentally. The methods that are best suited for the individual case can then be selected.

LITERATURE.

[1] JANET, *Les médications psychologiques*, Paris, 1919.
[2] CREUZE, *Les misères des neurasthéniques*, Paris, 1917.
[3] BEARD, *A Practical Treatise on Nervous Exhaustion*, New York, 1880.
[4] MÜLLER, *Handbuch der Neurasthenie*, Leipzig, 1893.
[5] WHYTE, *Causes and Care of Nervous Diseases*, Edinburgh, 1765.
[6] COBB, I. G., *Neurasthenia*, London, 1920.
[7] OSLER and MCCRAE, *System of Medicine*, vol. vii, ch. xviii.
[8] TREDGOLD, *Mental Deficiency*, London, 1922.
[9] STOCKARD, *Heredity in Nervous and Mental Disorders*, New York, 1924.
[10] JANET, *Les obsessions et la psychasthénie*, Paris, 1917.
[11] GERARD, *Journ. Biol. Chem.*, 1922, lii, 111.
[12] FELTY and MURRAY, *Journ. Biol. Chem.*, 1923, lvii, 573.
[13] DESCHAMPS, *Les maladies de l'énergie*, 1909.

[14] FÉRÉ, Quoted by Janet (loc. cit. (1)).
[15] DUBOIS, Quoted by Janet (loc. cit. (1)).
[16] BABINSKI and DAGNAN BOUVERET, *Journ. de psychologie*, March–April, 1922.
[17] MÜNSTERBURG, *Psychotherapy*.
[18] DEJERINE and GAUCKLER, *Les psychonévroses*, Paris, 1911.
[19] TISSIÉ, Quoted by Janet (loc. cit. (1)).
[20] BIRLEY, *Lancet*, 1920, i, 1147.
[21] SOLLIER, *Le mécanisme des émotions*, Paris.
[22] A. MEYER, unpublished.
[23] FERENCZI, *Sex in Psychoanalysis*, 1920.
[24] JONES, *Treatment of the Neuroses*, New York, 1920.
[25] STODDART, *Mind and its Disorders*, London, 3rd edition, 212.
[26] GILLESPIE, *Journ. Neurol. and Psychopathol.*, August, 1924.
[27] GILLESPIE, *Brit. Assoc. Reports*, 1925.
[28] EMDEN, *Zeits. f. physiol. Chemie*, 1915, 113.

CLINICAL HISTORIES.

CASE 1. Female, single, age 34; occupation, none.

Complaint: Ready fatigue with exacerbations ("exhaustion-attacks"); breathlessness, faintness and pain in the side; fear of going out; irritability and "nervousness", frequency of micturition.

Family history: She is the elder of two children. Her father is of a shy, nervous, dependent type and all his brothers and sisters are described as nervous. Her mother is of a worrying disposition.

Personal history: She was a premature infant and for a long time delicate. She had measles and scarlet fever at 15, followed by sore throat. She left school at 18, and studied for a civil service clerkship, passing well up in the list only to be rejected as medically unfit because of a cardiac murmur, of which she had been unaware. Accordingly she entered a bank. For the first year she liked the work and soon gained promotion, ultimately reaching the highest post open to her. This she held till 1921 when she resigned on account of ill-health. She has not worked since.

Present illness: At 19 at her first dance she felt faint and so ill that she was afraid. After being informed of her cardiac murmur she climbed hills in Wales without ill effect. In 1918 she began to feel weak and to have præcordial pain at the end of the day's work. In 1919 she moved to a quiet branch bank and her weakness and præcordial pain improved, but she became depressed and had a pain in her head. Her brother had just returned from war service and she had been looking forward to his taking her about; but to her surprise and disgust he married almost immediately a woman of inferior social standing whom the patient loathed. Work seemed to her to become increasingly difficult and in 1921 "everything seemed to go against" her. She focussed her attention on a distasteful pursuit by an elderly man who repeatedly endeavoured to speak to her in the train. His attentions, which she repelled, continued for about two months. She was very much afraid of him and during this time, morning nausea and vomiting, which she had suffered from at school, returned. On altering her time of travelling she escaped the unwelcome attentions of her pursuer, but shortly afterwards she had her first exhaustion-attack—she sneezed one afternoon, felt her legs shake and said, "What's going wrong with me?" Next day she felt very queer, and had pains all over, and the doctor diagnosed influenza, although she had no pyrexia. She had a week's sick leave but afterwards felt exhausted every afternoon. She resigned her position. Three months after the first attack, a second attack of exhaustion occurred similar to the first. She woke up one morning feeling hot, took her temperature (which was normal) felt weak

and tired and remained in bed for three weeks. This attack occurred immediately after she found herself obliged to do housework, which she disliked.

She has since had repeated "exhaustion-attacks"—"one really bad attack each spring," lasting for about two months. All outdoor games have been dropped and she has remained in bed in the mornings and played the invalid. On reflection at the recurrence of her attacks she herself connected the first one with the fear of the pursuit described above.

Personality: She has always been shy, but has usually had one close girl friend. Since childhood she has been excitable and nervous—afraid of the dark and of "everything." She was ambitious, studious, and conscientious and of a worrying disposition "like her mother." Trivial circumstances have readily depressed or elated her. Until 1918 she did not appear to be unduly concerned about her health.

Physical status: She is a tall thin woman of asthenic habitus. There is a faint systolic murmur at the apex and pulmonic area, but no evidence of cardiac enlargement. Examination is otherwise negative.

Mental status on admission: She answered questions intelligently and eagerly. Her mood was one of slight and variable depression, usually greater in the mornings, and tears came readily to her eyes. The depression came over her in waves and she felt utterly miserable for several days at a time. Her principal concerns were her health, her lack of aim and prospects, and her brother's marriage.

Course in hospital: She displayed a very obvious desire to get well. With detailed examination of the setting of each symptom, realization of the interconnections of her symptoms with events in her life, some simple explanation, *e.g.*, as to the relation between emotion and stomach symptoms, reassurance, encouragement and the adoption of a gradually more strenuous physical routine, she improved greatly till her day was fully occupied. Each increase in the daily programme was approached with anxiety, which became gradually less with each succeeding instance. Occasional feelings of fatigue were treated lightly till she came largely to disregard them. On her own initiative she made arrangements to stay away from home, as she felt that the latter was in an uninteresting and distasteful environment.

Etiology: In this case also there are family traits which suggest emotional instability. Further, the actual environment in which she was brought up is anxious. It is accordingly not surprising that the characteristics described above appeared in her personality at an early age. Whether inheritance or parental example was the greater factor is a moot question.

Her physical habitus—the "asthenic" or "visceroptotic"—is one that is commonly associated with symptoms of fatigue, but in the absence of organic disease (her heart condition must be discounted) the occurrence of the exhaustion in attacks at the same season each year and for about the same length of time, is suggestive of a non-physical origin. The setting of the first attack is important. She herself had recognised its relation to the unwelcome attentions of her railway admirer, but she did not recognise until it was pointed to her, how much she had played with this topic—she discussed such experiences with her girl friends, informed the bank manager and the police (but not her parents), read literature on the 'White Slave Traffic' and recalled that she had been previously accosted. Her first exhaustion-attack followed very quickly on the withdrawal of active interest when the persecution ceased.

At the same time she was harbouring a grievance against her brother for marrying a fat uneducated woman from whom she had a revulsion, physical and intellectual. Both these topics have an obvious connection with what she always regarded as the "beastly side of life"; but there was also disappointment that her brother's marriage left her with no one to take her out, as she had no men friends. These subjects possessed her mind,

producing anger, disgust and jealousy at a time when her interest in her work was failing—she could attain no further promotion—and (what was very striking) they were as lively an interest at the time of her admission to hospital, as when they first occurred four years previously. The exhaustion-attacks were always ushered in by acute anxiety, the bodily symptoms of anxiety having a strong suggestive value on account of her previous experience. The intervals between attacks are characterised by a minor degree of anxiety, which may be said to be always present, since it can be observed to appear on the slightest provocation.

In conclusion, she has symptoms originally provoked by a complicated emotional situation and sustained by the suggestive effect of experience and lack of understanding of their real value on a personality of an anxious mental habit which has existed since childhood.

CASE 2. Female, single, age 42; occupation, none.

Complaint: Excessive fatiguability, inability to do as much as other people; indigestion, breathlessness, palpitation, headaches, giddiness, malaise at menstrual periods; insomnia, and paraldehyde addiction.

Family history: Her father suffered from insomnia. He died of rheumatoid arthritis. Her mother is alive, age 71, and is "nervous" and "excitable." A paternal uncle is "nervous about himself" and sleeps badly. Patient is the youngest of three children. Of her sister's two children, one is a Mongolian idiot.

Personal history: Her mother's health during gestation was poor and she was a weakly undernourished infant. She was sturdy enough later. Menstruation began at 14. She was educated chiefly by governesses. At school from 11 to 14 years of age, she "liked it," but "did no work." She has never done any whole-time work. Jaundice, rubella and herpes zoster are the only illnesses she has had.

Present illness: Her parents noted no unusual fatigue in her childhood, but she now states that she was always more easily tired than other children. She dates an increase in fatiguability from the attacks of rubella and juandice at 21. Some years ago she was informed that the exhaustion of which she complained was due to "nervous bankruptcy" and she was placed in a nursing home, where, from her own statement, she was "too lively to rest," lost weight, but became less easily tired. In the last few years she has become increasingly engrossed in her health, and has been gradually getting into invalid ways, being too much indoors, and complaining of exhaustion when urged to take exercise. She herself claims that she is a great comfort to her old mother, whereas she is a source of great concern and difficulty.

She began to take paraldehyde for her insomnia at the time of the first anniversary of her father's death, which occurred more than two years ago. She says that she "dreaded the anniversary for her mother's sake" and felt that she "must have sleep at that time." Her sister's illness a year ago filled her with "great anxiety." She feared her sister would die. She has always been envious of her sister's superior health, appearance, and accomplishments. During the past winter the patient fancied that her doctor was in love with her, and she followed him to his new location in another town, on the pretence of requiring a holiday away from home.

Mental status on admission: She was very vivacious in manner and extremely talkative. There was no disorder of behaviour or of the stream of talk, but she was very circumstantial and displayed unusual frankness at the first interview in discussing her affairs, including her menstrual function, which she introduced unasked. Her principal topics were her health, her desire to be useful, and her doctor's supposed infatuation for her. Orientation and memory were intact. Attention was good for short periods. Her intelligence rating on the Binet-Simon scale was 12 years. She had no insight of any kind, attributing her exhaustion to family troubles.

Physical status: She is of diminutive stature (4 ft. 8 ins.) and unprepossessing appearance. The secondary sex characteristics are poorly developed. There is a systolic murmur at the apex, partially replacing the first sound, but no thrill and no enlargement of the heart. Examination was otherwise negative.

Course in hospital: She was able to dispense with hypnotics entirely after three nights of medinal gr. 5. She was already convinced that her heart was sound, and was very active, yet she declared herself too easily tired to do much. When the discrepancy between her statement of fatigue and the amount of her activity was pointed out, she refused to see it. In the penultimate week of her residence she complained of malaise, which she associated with her menstrual period, saying that the latter was unusually prolonged. She lost two pounds in weight, and was very anxious to remain, writing home pessimistic accounts of her health. She admitted to other patients that she was refusing food in order to lose weight. The purpose of all these complaints was to give her the opportunity to pursue a male patient to whom she was making unblushing advances.

Comment: The patient was a woman of unprepossessing appearance and poor intellectual endowments (mental age of 12), who tried to compensate for her deficiencies by social activity and "cultural" striving (*e.g.*, reading with a purpose). Her complaints of malaise and exhaustion were the excuses for the failure in compensation which inevitably resulted. Her lack of insight and the ill-restraint of her amatory activities were partly dependent on her intellectual deficiency.

CASE 3. Case 3 was that of a farmer, unmarried, who complained of lack of energy of about two years' duration. He was inactive, lay in bed a good deal, but showed no retardation. His chief topics were sexual and occupied his mind to the exclusion of business. Heredity and home environment were alike unfavourable, and neurotic traits (phobias) early appeared. A depressive tendency appeared even at school. His application to reality was disturbed by his excessive day-dreaming, and his career did not at all correspond with his ambitions—he fancied himself as the idol of sporting crowds, instead of which he was an unsuccessful farmer. Further, he was thwarted in his marital ambitions, and his feeling of inferiority in this direction was associated with the idea that he was impotent. His impotence he explained to himself as due to his general lack of energy. When it was pointed out to him that the latter was an expression of disappointment and dissatisfaction with his work and with himself (he was sensitive about his appearance and his failures) and that it represented a partial withdrawal from reality into his phantasies, he gradually accepted the explanation; and on putting it into practice, he improved considerably.

CASE 4. Male, age 34, married; teacher.

Complaint: Generalised fatigue, "nervousness," eructations, headaches, weakness in left side, and præcordial pain.

Family history: A paternal and a maternal grandparent died of a paralytic stroke.

Personal history: He had enuresis until the age of 14. He graduated from college and afterwards frequently changed his occupation, finally becoming a teacher "to do something good for the world." At 31 he married, and his wife died six months later. At 33 he married again, although in debt at the time. He was usually sociable, but was occasionally slightly depressed and diffident.

Present illness: Immediately after his second marriage (Sept. 1923) he discovered that he disliked his wife. She became pregnant in November although he had used means (coitus interruptus) to avoid this, and he developed frontal headaches and became irritable. Finally he felt so weak that he gave up work (December). Insomnia, eructations and vomiting, lumbar pain and loss of weight (14 lbs.) followed. In the two weeks preceding admission he was moody and discouraged.

Mental status: He was apprehensive of physical examination. His mood he described as "bitter" but not sad. Hypersensitiveness to noises was marked. He talked slowly and dramatised his symptoms. There was some subjective difficulty in thinking.

Orientation, retention, and calculation were accurate. In remote memory he showed some uncertainty about dates. He had no insight into the etiology of his condition.

Physical status: On admission he walked limply with the aid of two sticks. There were paresis and hypalgesia of the left arm and leg. The reflexes were bilaterally equal and not exaggerated. Sugar tolerance in the blood was diminished. Hunt and Pembrey's exercise tolerance test showed him to be only 40 per cent. fit.

Course in clinic: From being very inactive and listless, he began to move about readily, but still complained of fatigue after exercise. He realised to some extent the relation of his mental difficulties to the onset of his symptoms. The question of discharge from hospital elicited symptoms of a relapse, but finally all his complaints disappeared, with the exception of fatiguability, which he protested was still present in a minor degree.

Etiology: His symptoms, of which fatigue was most prominently dramatised, developed in response to a difficult situation, dislike for his wife, her unwanted pregnancy, and his own financial indebtedness. They provided a temporary escape from his home environment. His reluctance to go back was shown by the recurrence of symptoms when the question of his discharge from hospital came up.

CASE 5. Case 5 was that of a business man of 49, who complained of fatigue, physical and mental, of one year's duration. He was ambitious out of all proportion to his financial resources and his actual status as a business man (his undertakings were numerous and involved millions of pounds). He had no interests other than his business and had taken no holiday for 19 years. His schemes were already going wrong when a frontal sinusitis acted as precipitant for a group of symptoms, and gave a physical colouring to them all, which made the patient, who was reluctant to admit discouragement and defeat, unable to see that his symptoms were based on, and sustained by, his business difficulties. This view is confirmed by the fact that when the sinusitis had been efficiently dealt with his symptoms became worse because his affairs became more involved.

The chief physical signs were a diminished exercise tolerance and a diminished basal metabolic rate. The latter suggested that the symptoms might be in part due to thyroid deficiency (thyroid exhaustion from the previous sinus toxæmia ?) but administration of thyroid, while it restored the B.M.R. to normal limits, produced no amelioration in the symptoms.

In this series, Cases 6 and 7 were those in which masturbation figured prominently in the anamnesis.

CASE 6. Case 6 was that of a single woman of 38, who had developed anxiety symptoms following the renunciation of masturbation at 23. Fatigue developed only at 38, soon after the marriage of a favourite brother and during the pregnancy of his wife.

The fatigue signalled the development of a more acute conflict provoked by the immediate situation, and involving to her great distress a death-wish to her sister-in-law and her child. Jealousy of her sister-in-law's place in her brother's affections, as well as simple resentment at the increased burden of work she had to sustain, was the principal factor.

In Case 7, fatigue developed in direct relation to the renunciation of onanism.

CASE 7. Male, age 24, single; clerk.

Complaint: Easily tired, depressed, and afraid of insanity.

Family history: Paternal grandfather alcoholic, father "nervous," maternal grandfather and great-grandfather and uncle alcoholic; mother's family all "pessimistic."

Personal history: As a child he was in the habit of biting his nails and he suffered much from "colic." He was always shy and bashful and played little. He attended school from six to 16, when he went to a military academy where he disliked the discipline and the "roughness" of his fellows, and became home-sick. At the end of a year he entered a university and did fairly well in his first year, but in the following session he disliked it, failing in one subject. He did not go about socially, finding refuge at home instead,

In February 1920 he left the university, having again failed in his examinations. He had no marital ambitions. He had masturbated from the age of 12, and had desisted in favour of heterosexual relations from the age of 15.

Present illness : In January 1919 he resumed masturbation and felt tired and depressed after it. He worried about it and abandoned it in June 1919. In the autumn of 1919, on returning to the university, he became depressed, continuing to worry about the effects of masturbation. After five months' idleness, he worked in his father's shop but was dissatisfied with his remuneration and his insignificant status. He developed peculiar feelings round his mouth and complained of indigestion and constipation. On a few occasions he took alcohol to "steady his nerves."

Mental status : His posture was slouching and his speech hesitant, and he was depressed and concerned over masturbation. Formerly he had felt that people might read his mind or in some other way know why he was depressed. There was some anxiety about possible insanity. He complained of difficulty in concentrating. There was moderate insight.

Physical status : He was tall, of asthenic habitus, and undernourished. There was no evidence of infection or of organic disease.

Course in hospital : He shewed an increasing amount of interest and activity and endeavoured to accept the psychological explanations offered him. His initiative increased, but waves of depression of brief period occurred from time to time and were accompanied by disinclination for activity.

Comment : This case is of interest because it is the only example in the series where the fatigue followed principally on masturbation. But it was not simply this practice, but conflict over it, that existed in this case, which is therefore in close correspondence with the others in that this patient also fell ill from emotional and not from physical causes. The case is also of symptomatic interest since the connection between ideas of mind-reading and feelings of guilt, which is present but hidden in full-blown schizophrenic psychoses, is clear to the patient.

CASE 8. Female, age 45, unmarried ; book-keeper.

She complained continually of "exhaustion" which often prevented her leaving her bed. It was accompanied by "dizziness" (rocking of floor) and by feelings in the head and pains in the body. At times of greater depression she emphasised her bodily condition.

Exhaustion was the leading complaint, but it was found to have developed as part of a chain of symptoms, which occurred in an abnormal personality with a tainted inheritance. These symptoms were precipitated by business difficulties which had only a remote connection with her, but which may have served to evoke guilt-feelings in another more personal connection. Rumination of a sexual kind was prominent, and brought dissatisfaction and probably increased her tendency to stay in bed, *i.e.*, her "exhaustion." The exhaustion developed in the sphere in which she had been accustomed to take most active interest (athletics) and represented a failure of this sublimation.

CASE 9. Female, age 30, unmarried ; no occupation.

The relation of exhaustion, which was her leading complaint, to emotional conditions was clear enough. It first appeared after an operation which took place at a time when she was dissatisfied and seeking solace in ruminations, and which was intended to relieve a condition of which the emotional origins were sufficiently obvious (relation of dyspepsia to scenes at meals, and her attachment to her father who caused these scenes). The fatigue underwent an exacerbation when her father died, her only sympathiser being thus removed. As she had no resources for readjustment such as occupation, the fatigue continued unrelieved. The case is another example of the ill-success of operations performed for the relief of conditions of unrecognised emotional origin.

CASE 10. Female, age 37, unmarried; schoolmistress.

The patient had (erroneously) been informed 10 years before admission that she had cardiac disease. To this information she reacted with anxiety and excessive caution. Five years later she had a mild secondary anæmia, which she was told was pernicious anæmia. (Her father had died of pernicious anæmia.) She then began to suffer from sudden weakness, numbness and breathlessness. As she had had menorrhagia for some time, hysterectomy was performed two months before she came under treatment for exhaustion, which had persisted after the operation to such an extent that a five-minute walk "exhausted" her.

That the origin of the exhaustion was partly emotional was evident from its close connection with anxiety. Her exhaustion and anxiety were probably both in part iatrogenic, the result of the announcement that she had a heart lesion and pernicious anæmia—of neither of which was there any convincing evidence at the time her symptoms came under notice. Her very rapid response to reassurance and encouragement bore out the hypothesis that her physical symptoms were largely dependent on anxiety. The foundations of her anxiety lay in her inheritance (perhaps) and family environment, and in her dissatisfaction with her work and her social relations.

CASE 13. Male, age 38; journalist.

Complaint: He was excessively fatigued for the two months preceding admission, and latterly he had been sleepless and afraid.

Family history: He is of Irish descent. His father was "difficult" and his mother had anxiety symptoms. His only brother is alcoholic and a sister is a chronic invalid.

Personal history: He left school at 11 years of age, his father sending him to work. At 15 he ran away from home, having quarrelled with his father. He worked to keep himself at school for two years, and then returned to work at home to support his family. Two years later he went into the newspaper business, and he has remained there as reporter, editor, etc. The death of his father three years before admission made him depressed and afraid, and the death of his mother four months later was a still greater shock. In April 1922 he went abroad to edit a newspaper, but returned in September as he could not get on with his associates. On his return he worked for two months as a copy-reader, but found his superior "unsympathetic." He then (1923) went abroad as a press correspondent, but remained only eight days, as he thought he was being pursued. On again returning home he acted as a reporter, with long and uncertain hours. He has always been a timid, dependent, shy, conscientious person, with a strong attachment to his mother and a strong religious bent.

Present illness: Two months before admission he began to complain of extreme fatigue and loss of appetite, and to have violent nightmares. His work made him so "nervous" and gave him such irregular hours that he resigned. He began to reproach himself for accepting certain money and he became much afraid of pursuit by detectives.

Mental status: His facial expression and bodily posture were strained. His mood was usually one of depression and apprehension, with occasional episodes described by him as "exhilarated." At nights the apprehension sometimes culminated in panic. A feeling of guilt and self-accusation coloured his preoccupations, which were chiefly with religious and sexual topics. Ideas of reference were frequent. He had feelings of influence and an actual desire for them ("salvation" attitude). Orientation, memory, attention, and general information and intelligence were intact.

Physical status: He was of asthenic habitus and undernourished, but without organic disease of any kind.

Course in hospital: He became on the whole less depressed, but his mood varied, and along with this variation in mood the amount of insight fluctuated, but never approached completeness. He involved the hospital in a poorly systematised delusional scheme, which finally made it advisable that he should leave to be in his wife's care at home.

Comment: He had the disadvantages of a morbid inheritance and of an unhealthy and difficult home environment which may have been partly accountable for the difficulties he had later in getting on with others. His personality on a whole was of the shut-in type and with his strictly religious upbringing was ill-adapted to meet the self-reproaches resulting from sexual irregularities and from the receipt of moneys for reporting in the interests of a group of people who were afterwards proved to be corrupt. It was while in conflict with himself over the latter affair that he became so fatigued. His fatigue was increased by the irregularity of hours at a time when he was in a particularly unstable emotional condition. The fatigue presaged an illness of a schizophrenic paranoid type.

CASE 16. Male, age 38; school teacher.

Complaint: Constant fatigue, constipation, palpitation after meals, "soreness over liver," "lightheadedness," and "shakiness" at intervals, anorexia, and morning nausea.

Family history: There was no outspoken mental disorder, but many neurotic traits among his progenitors and fraternity.

Personal history: He was a timid child, afraid of the dark, much attached to his mother, and with neurotic habits such as nose-picking. At four years of age he had a right temporal abscess and three years later "bilious remittent fever." At 13 he had chorea. He had measles (date unknown) with subsequent hemiplegia. At 20 he was operated on for chronic appendicitis. He went to school at 11, and left college at 21 after a distinguished career there. He was always a very hard worker, with few friends, shy with women, fond of music, but not of outdoor games. As a child he was ashamed of his puny physique, and in his illness he still blames his mother for this (although he is now well developed) and for his subsequent poor health.

Present illness: His first mental illness occurred at the age of 17, when he was depressed and sleepless for three months after a failure to reach the honours level in college. At 24 after an incident of illicit intercourse he developed an excitement. At 25 another attack of excitement occurred, and since then similar attacks have occurred every two years on the average. The excited phases last for about three months, and the intervals are marked by brief periods of depression with retardation and with some ideas of persecution, hallucinations (auditory) and self-accusations. In at least one excitement there was ecstasy with ideas of universal well-being. An occasional antagonism to his brother in the excited periods is based on the patient's having learned masturbation from him. His insight in the intervals is only of moderate degree and he insists that a physical basis is likely, in view of the symptoms enumerated above.

Mental status on admission: He was subdued in manner and slow in speech and action. His mood was mildly depressed, with morning and evening remissions. He was principally concerned over his physical health, and with the relation of his illness to his ambitions (marriage and career) and of his religious beliefs to his early sexual practices. A failure of emancipation from his mother was very evident. There were no sensorial or intellectual defects.

Physical status: He was a heavily-built man of athletic physical type. Very careful examination of every system failed to reveal physical disease of any kind.

Course in hospital: He became more depressed, slept less, was irritable and jealous and showed some bizarre behaviour and mannerisms. This may have been in part the result of the physician's statement that no physical disease was present to account for his symptoms (as he had hoped). Preoccupation was very marked and he was very uncommunicative. He distributed tracts and assumed at times a mildly superior attitude. His condition (especially as to co-operation) improved slightly before discharge. His mood latterly was not distinctly depressed; there was a great deal of preoccupation, much irritability and sulkiness rather than depression.

Comment: Here fatigue was a leading physical symptom in what was essentially a condition of affective depression. Its importance arose from the prominence given to it

by the patient, as evidence of the physical basis which he assumed to explain his illnesses and his failures to attain his ambitions or even to fulfil his duties. In the etiology of the condition, hereditary factors and defects in personality are very apparent and in more immediate relation to the earlier attacks lay disappointment and conflict. Symptomatically the case is very interesting from the point of view of the great admixtures—of schizophrenic symptoms (projections) in an affective setting and of the numerous modifications of the affective disturbances themselves.

CASE 20. Male, age 25; medical student.

Complaint: Exhausted languid feeling, "smoky" vision, feelings in head, worry over condition, inability to concentrate, insomnia.

Family history: His father was periodically alcoholic and died after an alcoholic bout.

Personal history: He had measles, mumps, chickenpox, scarlet fever, and pneumonia before he was 10. He did well at school and college and was sociable and lively. In November and December 1918 he suffered from weakness and some depression following an influenzal attack of gastrointestinal type. His recovery was slow. In the autumn of 1920 after a severe coryza he felt weak and dizzy, and mildly depressed, and had difficulty in vision which passed off in two weeks. In November 1921 he had a recurrence of these symptoms following an illness diagnosed as influenza.

Present illness: In December 1923 after a coryza he felt weak, became fatigued on the slightest exertion and was unable to concentrate. He had difficulty in making decisions and was slightly irritable. There was "smokiness" of vision.

Physical status: He was a well-developed and fairly well-nourished youth of athletic type, without signs of infection or of organic disease.

Mental status: His facies was serious but not sad. Thinking was subjectively difficult, but there was no objective evidence of slowing of thought. There was no motor retardation. He admitted occasional topical depression (especially the interference of his illness with his curriculum). Orientation, memory and general information and intelligence were unimpaired. He explained his condition as due to "nervous exhaustion." Later he divulged that he was married and that his marriage was proving a hindrance to his career.

Course in hospital: He improved gradually in all his symptoms and was discharged not entirely recovered.

Comment: This is an example of repeated attacks of exhaustion following infection, which was sometimes very mild. The symptoms persisted long after the signs of infection had disappeared and this persistence in the latest attack was probably due in part to the marriage-situation.

CASE 21. Female, age 17; schoolgirl.

Complaint: Overactivity, followed by fatigue.

Family history: Her father died of aortic aneurysm at 45. A paternal uncle is alcoholic. Her mother was moody and sensitive as a girl. The patient is the fourth of eight children, all living. The third child is "highly-strung."

Personal history: In childhood she was considered delicate. She had measles in infancy, diphtheria at six, and influenza at 12. She began school at six and left high school in 1923. Her school work was good and she had latterly been a pupil teacher. Menstruation began at 13. For the year before admission she was much interested in a school-fellow and talked of marrying in four years. She has always been active, planning and working busily, and was ambitious, conscientious, sensitive and reserved.

Present illness: In April 1923 the patient attended religious revival meetings, was regarded by the minister as "promising," and at one meeting was "hysterical" in her behaviour. In the last week in April she was much more active and talkative than usual. On April 30 she became restless, said she was pregnant and that she had seen her father (who is dead). Insomnia, spatial disorientation, destructiveness and carelessness with

excreta developed. After June 1 she was quieter, would not talk for long periods, and often ate with her fingers. Mocking and causeless laughter occurred. Occasionally she seemed elated. Some insight was present from the beginning—she felt "kind of unsettled."

Mental status on admission: She was restless, smiled occasionally and grimaced. The only mood statement was that she "felt good." Her attention was poor, and there was some distractability. Preoccupation sometimes led to delay in answering, or to breaking off in conversation. She spoke little, with some stereotyped repetition of "Who are you?" Where am I?" Hallucinations may have been present. Orientation was approximately correct in all spheres. Formal examination was impracticable (lack of co-operation). She was destructive and untidy with food, clothes, and excreta.

Physical status: She was of small stature, stout and of pyknic habitus. There was no evidence of organic disease or of infections.

Course in clinic: She spoke of having had several babies recently and gave other evidence of sex phantasies. There were occasionally evidences of flight. Once she was much terrified, saying she saw a snake on a tree. In August 1923 she began to improve, taking more interest. On August 19 and September 2 she had transient attacks of nausea, abdominal pain and vomiting, with temperature of 100.4 and a leucocytosis of 10,200. These conditions subsided and she was mischievous, ate ravenously and slept much. When awake she was active and boisterous, but did not give the impression of elation. She swore and was generally impolite. Discussion of her condition was refused. As her improvement continued some elation and playfulness became evident. Her interests were superficial and there was some mild erotic behaviour. Gradually she became normal, displayed some recollection (with insight) of her early symptoms, and complained of being easily tired and of being easily made breathless.

Comment: The fatigue in this case was the aftermath of an emotional crisis in an adolescent girl. The crisis had the form of an excitement of a mixed type, best described probably as manic with some schizophrenic symptoms. The prodomata included religious enthusiasm.

A CASE OF CHRONIC INTERNAL HYDROCEPHALUS DUE TO EPENDYMITIS GRANULARIS.

By SARAH H. NELSON, Glasgow.*

It is well recognised that chronic internal hydrocephalus can simulate many conditions. The following case serves as an illustration of the difficulty which is encountered in its clinical diagnosis. Clinically, intracranial tumour of undetermined localisation was considered the most probable cause of the symptoms, whereas at post-mortem examination the pathological condition was found to be chronic internal hydrocephalus, caused by a lesion situated in the ependyma and generally known as ependymitis granularis. The clinical study was rendered more interesting, as a case with a similar clinical picture was admitted to the wards later. In this latter case a diagnosis of cerebral softening was made and at autopsy pachymeningitis hæmorrhagica interna was found.

CLINICAL HISTORY.

J.M., female, age 50, was admitted to the Royal Infirmary, Glasgow, on August 8, 1921, complaining of "weakness" of seven days' duration. She consulted her doctor on account of inability to use her limbs, in which there was a feeling of stiffness. For a month prior to admission she had suffered from diarrhœa, passing fluid stools which contained mucus but no blood. She had had no headache or sickness and there was no history of lethargy or of disturbance of vision.

In 1916 she had experienced a similar illness which had been diagnosed as influenza. She was then confined to bed for two weeks and did no work for eleven weeks. On that occasion the paresis was more marked on the left than on the right side and that disparity has been maintained. Otherwise, her general health had been good.

Physical examination on admission: Temperature 98.2° F., pulse 102, respirations 32. The patient was well developed and well nourished; her complexion was fresh and she did not look ill. She lay comfortably in bed. The skin over both shins was pigmented and an ulcer, possibly varicose in nature, was present on the left leg. There was a bedsore over the left buttock.

She was very apathetic and spoke only when a question was addressed to her, answering in a slow, deliberate, but intelligible fashion. There was some impairment of mental processes, for she professed that she was able to sit up in bed and to turn herself, although when asked to do so she made no attempt to comply. All her movements were feeble but there was no evidence of actual paralysis. The face was almost devoid of expression or emotional play. In speech the right angle of the mouth moved only slightly, the left even less, due apparently to rigidity.

The pupils were circular, regular in outline and equal in size, and reacted sluggishly to light. Convergence on looking at near objects was defective. There was no nystagmus

* McCunn Research Scholar, University of Glasgow. From the Department of Pathology, Royal Infirmary, Glasgow.

or strabismus, and no evidence of actual facial paralysis. The tongue was slightly tremulous but could be protruded without deviation. There was no cervical rigidity.

The arm and the knee jerks were present and there was a degree of ankle clonus on the right side. The plantar reflexes were flexor in type. The abdominal reflexes were not obtained. There was no disturbance of sensation. Both arms and both legs showed rigidity. The patient could raise the right arm slowly above the head and the left to the level of the shoulder only. The right hand grip was feeble; the left was powerless. There was involuntary evacuation of the bladder and bowels.

During her five weeks' residence in hospital, the patient continued to be apathetic and became very helpless. She was unable to feed herself or to move in bed, except that at times she could draw the knees up. Knee clonus was noted on the right side. She continued to have involuntary evacuation of the bladder and rectum. The temperature, which had been subnormal, rose on the sixteenth day and became swinging in character. The left knee joint became swollen, but she did not complain of pain. She developed cystitis, due to a *B. coli* infection, and the number of bed sores increased. She was very feeble and had some difficulty in swallowing. The rigidity became less marked. She became semi-unconscious on October 26, and died on October 30, 1921.

Pathological Report.

Nothing abnormal was found in the thoracic and abdominal organs except in the kidneys which were the seat of chronic nephritis. There were no indications of syphilis or of chronic alcoholism.

Head: A small amount of ante-mortem clot was present in the superior longitudinal sinus. The vessels of the dura mater appeared congested. The convolutions were flattened.

When after hardening in formalin a horizontal section of the brain was made, marked hydrocephalus associated with diminution in thickness of the brain substance was observed (see Fig. 1). The walls of the anterior and posterior horns of the lateral ventricles were deeply furrowed and the ridges between the furrows were each surmounted by a dilated vein. The floor of the ventricles presented a reticulated appearance.

The brainstem was separated from the hemispheres by a coronal section and various sections were made at different levels through the mesencephalon, pons and medulla. The hydrocephalus affected the whole ventricular system. The aqueduct of Sylvius was distended to about four times its normal diameter. Serial sections were made from paraffin blocks of the medulla and pons and stained with (*a*) hæmalum and eosin; (*b*) Heidenhain's hæmatoxylin and v. Gieson, and (*c*) toluidin blue.

Microscopically the fourth ventricle was the seat of granular ependymitis (see Fig. 2). This pathological ependymal condition consists in the formation of 'granulations' on the walls of the cavities lined by ependyma. In the present case there was marked proliferation of the subependymal glia, which could easily be distinguished from the normal tissue in that it was differently disposed. The fibres were for the most part closely packed together, arranged in layers, concentrically, or in whorls. In the centre of the whorl the neuroglia was rich in cells. At the junction of normal and abnormal tissue rarefaction was observed, the structure being much looser in character. In various situations there was marked vacuolation of the glia in the neighbourhood of blood vessels. The tissue also appeared to be œdematous. Another feature of the less dense glia was the aggregation in some places of small homogeneous bodies which appeared to be either of a fibrinous or hyaline nature and might have been thrombosed capillaries. The new formed tissue was very vascular and the vessels showed marked hyaline changes.

The 'granulations' which surmounted the subependymal gliosis appeared as 'hillocks' or polypoid outgrowths of various shapes and sizes projecting into the fourth ventricle. These projections consisted of neuroglial fibres, and were very rich in cells, the nuclei of

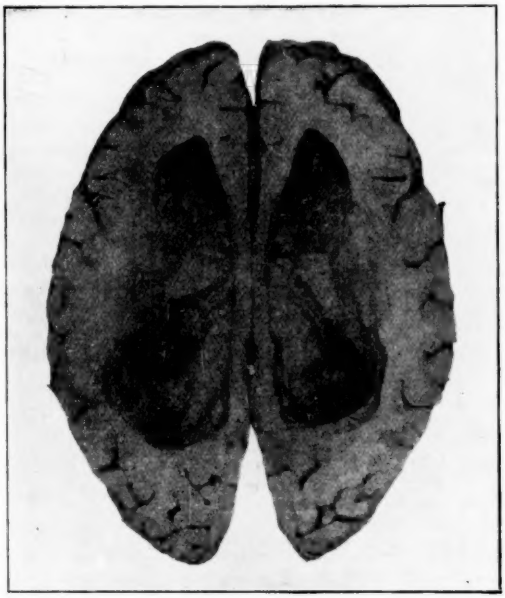


Fig. 1. View of lateral ventricles showing marked distentions.

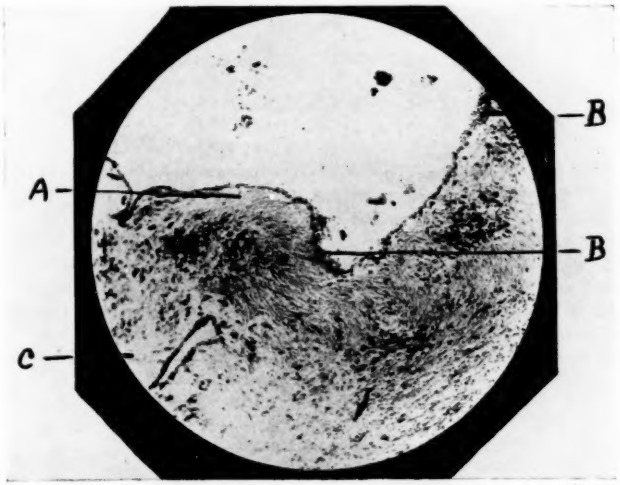


Fig. 2. Section showing bridge of glial overgrowth spanning the foramen of Luschka.
A. 'Granulation' showing neuroglial fibres. Note the numerous cells.
B. Proliferated ependymal cells. C. Acinus lined by ependymal cells.

which were oval or elongated in the direction of the fibres. The ependyma at the summits of some of the 'granulations' had disappeared. In other places it had proliferated, forming three or four layers of cells. Many crypts were present, due apparently to the invagination of the ependymal lining. In addition, acini lined by ependymal cells were observed. These acini seemed to be formed either by the fusion of two projections or by invagination of the ependyma. In either case, it is possible that the epithelial lining might have been incomplete in the first instance but the gaps have been filled by proliferation of the ependymal cells. In certain of the acini fragments of choroid plexus were seen. The ependyma at some levels appeared to form the base line of the proliferated glia. The choroid plexus seemed to be enlarged and hyperplastic. Some of the cranial nerves seen in the sections showed interstitial overgrowth. In none of the pathological areas were lymphocytes, plasma cells or any inflammatory cells observed. A few corpora amylacea were present but not always in association with a blood vessel.

Fig. 3. Section of Upper Medulla.

a. Ependymitis granularis. (Shaded part).
b. Choroid plexus.
c. Foramen of Luschka. (Blocked).
d. Acinus lined by ependymal cells.

There must have been some dislocation of the brain substance in the floor of the fourth ventricle, as ganglion cells were seen in some of the ependymal projections. In this ventricle the ependymitis affected the floor, roof and walls. The excrescences had spread downwards between the restiform bodies and cerebellum, pushing the choroid plexus before them and completely blocking the foramina of Luschka (see Fig. 3).

Paraffin sections were made of the cortex and of the wall of the lateral ventricle and stained by the three methods mentioned above. The meninges and the cortex showed no perivascular infiltration such as is seen in general paralysis of the insane. Some slight chromatolysis of the cortical cells was observed. The walls of the lateral ventricles were studded with granulations in some situations, but for the most part the sections showed the *état reticulé* which is described later.

DISCUSSION.

The present case revives an interest in the etiology of chronic internal hydrocephalus and in the etiology and characteristics of lesions of the ependyma.

Clinically, hydrocephalus may be attended by symptoms suggesting intracranial tumour. Spiller[1] has described a case of internal hydrocephalus in which the differential diagnosis from cerebral tumour was very difficult. The third and lateral ventricles were much distended, while the fourth was of normal size. The aqueduct of Sylvius was occluded by overgrowth of neuroglial tissue and ependymal cells (ependymitis). Marinesco and Goldstein[2] have recorded a case of pseudo-tumour, the condition being in reality one of serous meningitis (ependymitis), resulting in acquired hydrocephalus.

The etiology of hydrocephalus.—According to Dandy[3] every case of hydrocephalus has its specific cause. The old conception of an idiopathic variety is now practically abandoned ; the essential causation of all its forms is believed to be obstructive. When the obstruction affects the foramina of Luschka and Majendie there are two types, one intrauterine with hydrocephalus present at birth and due probably to non-development of foramina, the other occurring at any age and always due to meningitis, which includes ependymitis. Stengler states that ependymitis granularis is the commonest cause of chronic internal hydrocephalus in adults.

Normally the cerebrospinal fluid is formed by the choroid plexuses of the lateral and third ventricles, and passes by the iter of Sylvius to the fourth ventricle, mixing with the fluid formed by the small plexus quarti ventriculi. Thence it escapes through the ependymal roof of the fourth ventricle by the central foramen of Majendie and the two lateral foramina of Luschka (these latter are situated at the lateral recesses between the flocculi of the cerebellum and the restiform bodies). It passes directly into the cisterna magna and thence diffuses itself upwards by the pontine and basal cisterns and the cisterns of the Sylvian fissure, and downwards in the subarachnoid space surrounding the cord.

It has been pointed out that the causal factor in the present case was ependymitis granularis obliterating the foramina of Luschka. Regarding the etiology of granular ependymitis, Delamere and Merle[4], in their article on chronic lesions of the cerebral ependyma, have compiled an exhaustive bibliography of cases of pathological affections of the ependyma recorded between 1694 and 1909. They remark on the indifference which has been shown to lesions of that tissue. In their opinion most authors treat the affections as anatomical curiosities without any clinical interest. Ependymitis granularis may be found, according to these authors, in a large number of conditions, such as senility, chronic alcoholism, and syphilis. Some authors, whom they quote, hold that syphilis is the only causal factor. Many do not emphasise the causal relationship, but mention ependymitis granularis as an invariable accompaniment of general paralysis of the insane.

Delamere and Merle classify changes in the ependyma as follows :—

(*a*) Granular ependymitis, the most common form.

(*b*) *État reticulé*, a further stage of (*a*), where the granulations have coalesced to form a network.

(*c*) *État aréolaire*, a still further stage where the gliosis is in the form of a covering of equal thickness.

(*d*) *État varioliforme* of Pierre Marie, seen in the brains of normal adults, where the changes macroscopically resemble the surface lesions of smallpox.

(*e*) *État cryptique*, seen in the brains of adults. The crypts in this form are due to sinking of the ependymal surface and are determined by rarefaction of the subjacent tissue.

The causes of the conditions, according to their own investigations, may be tuberculosis, syphilis, tænia echinococcus, senility, alcoholism and other chronic diseases. Tubercular lesions may be identified by the presence of tubercular follicles, and syphilitic granulations by the presence of plasma cells, lymphocytes and, conclusively, by the presence of the *spirochæta pallida*. They discuss the question whether hydrocephalus is a sequel to ependymitis granularis or *vice versa*, or whether they are independent sequelæ of the same toxin. They cite the analogies of a pleurisy with or without hydrothorax and of a hydrothorax without pleurisy, and suggest that, in the same way an ependymitis may or may not be accompanied by hydrocephalus and that a hydrocephalus may occur independently of an ependymitis.

Bolton[5], in discussing lesions in the brain in cases of mania, states that granularity of the ependyma is probably due to a loss of function of the epithelium, due to its being bathed with abnormal cerebrospinal fluid, which contains products of neuronic degeneration. The condition occurs chiefly in the regions most subject to stagnation of the cerebrospinal fluid and probably corresponds to the normal proliferative condition of the epithelium of the central canal of the cord seen in adults. There the canal is decreased in size, owing to the development of the white matter, with a consequent absence of flow of the fluid.

Kaufmann[6] considers that inflammations, "serous meningitis of the ventricles," occasioned by alcoholism, injury, and acute infections, are etiological factors. He quotes Margulis, who holds that chronic hydrocephalus internus is due to a chronic periependymal gliosis which for its occurrence depends on a disturbance of development of the glia following on intrauterine pathological conditions. Through trauma, alcoholism, etc., the latent and innate power of proliferation on the part of the glia is set free. The condition, he adds, is frequently accompanied by syringomyelia, which represents merely a different localisation of the process.

The cord in the present case was not examined but no sign of syringomyelia was present in the medulla.

Schrottenbach[7] states that acquired internal hydrocephalus may occur in early life in cases of rickets, but the etiology is obscure. Aschoff[8] mentions the occurrence of ependymitis granularis in general paralysis of the insane, but states that the ependymal condition is not confined to that disease nor is it pathognomonic of it. Granular ependymitis has also been described in disseminated sclerosis by Dawson[9].

It would appear, then, that the etiology of granular ependymitis is still undecided: according to one view it is of inflammatory origin, according to another it is of non-inflammatory origin and of the nature of a sclerosis.

The brain in this case was examined for the presence of the *spirochæta pallida* by Dr. J. A. W. McCluskie, Western Infirmary, Glasgow, with negative results.

The ventricles of the following brains were examined for comparison.

(1) Case of chronic encephalitis lethargica. Macroscopically, the ventricular walls had an appearance of vesication: microscopically, ependymitis of the *aréolaire* type was found.

(2) Case of internal hydrocephalus. Unfortunately the brain had been cut up for other purposes, and the cause of the hydrocephalus could not be determined. The Wassermann reaction (blood) was negative. Ependymitis granularis was present in a slight degree in the fourth ventricle and in the aqueduct of Sylvius.

(3) Case of pachymeningitis hæmorrhagica interna of non-syphilitic origin. No definite pathological change was found in the ventricular walls.

(4) Case of general paralysis of the insane. Granular ependymitis was present. Plasma cells and lymphocytes were observed in the new-formed tissue, but not in abundance.

SUMMARY.

(1) In the present case it would seem that the internal hydrocephalus has been the result of occlusion of the foramina of Luschka, due to an overgrowth of the subependymal glia commonly designated granular ependymitis. Since the roof of the fourth ventricle was also the seat of the ependymal change it seems possible that the foramen of Majendie may have been occluded in the same fashion.

(2) No stigmata of syphilis (unfortunately the Wassermann reaction had not been performed, nor had the cerebrospinal fluid been examined cytologically), of tuberculosis, or of any other chronic inflammatory lesion have been observed; and, similarly, there is inadequate evidence to justify the view that the condition is of the nature of a gliosis.

(3) The very marked proliferation of glial tissue projecting through the foramen of Luschka seems to warrant the opinion that internal hydrocephalus has been a secondary phenomenon, although it cannot be denied that progressive stagnation of the cerebrospinal fluid may have exaggerated the glial overgrowth.

(4) Chronic nephritis was present, but its relationship to ependymitis granularis cannot be defined.

(5) It would appear from the examination of the present case and the other cases considered that granular ependymitis may occur in non-syphilitic conditions.

I wish to express my gratitude to Professor W. K. Hunter, of the Royal Infirmary, for permission to examine the brain, to Professor J. H. Teacher for the privilege of working in his Department, and to Dr. J. A. G. Burton for the photograph reproduced as Fig. 1.

REFERENCES.

[1] Spiller, W., *Amer. Journ. Med. Sc.*, July, 1902.
[2] Marinesco and Goldstein, *Nouv. Icon. de la Sâlp.*, 1912, xxv, 47.
[3] Dandy, *Surg. Gynec. and Obst.*, 1921, xxxii, 112.
[4] Delamere, G., and Merle, P., *Arch. de méd. exp.*, 1909, 458.
[5] Bolton, J. S., *The Brain in Health and Disease*, 145.
[6] Kaufmann, *Spezielle Pathologische Anatomie*, 1922, ii, 1433.
[7] Schrottenbach, cited by Kaufmann (ref. 6).
[8] Aschoff, *Pathologische Anatomie*, 1923, ii.
[9] Dawson, W., *Rev. of Neurol. and Psychiat.*, 1916, xiv, 166.

THE PSYCHOLOGY OF CHARACTER.—II.

By WILLIAM BROWN, London and Oxford.

We have now to consider the general question of the structure of personality, as revealed by the study of pathological cases. All the evidence of pathology points to the necessity of believing in an unconscious form of mental activity, which may in certain conditions show itself in consciousness. The large majority of people who concern themselves with psychopathology believe in the unconscious mind, and look upon consciousness as only one characteristic of mental process in certain conditions, when certain conditions are fulfilled. And in modern times it is important to realise that the unconscious mental is not merely what at one time or another has been conscious and has been driven out of consciousness. Many people think the modern psychoanalyst works in terms of consciousness which becomes unconscious under the influence of repression or mere neglect. We have a distinction of the pre-conscious and the unconscious, where the pre-conscious is not conscious at the moment but capable of becoming conscious under certain conditions of redistribution of attention. Originally the unconscious, for Freud, was those forms of mental activity that were driven out of consciousness by the process of repression and suppression. The general distinction between the unconscious and the pre-conscious corresponded fairly closely to the distinction between repressed and unrepressed memories and mental tendencies. That is not quite an accurate statement of the position at the present time. I do not wish it thought I am closely following Freud. I am not concerned to give an exact statement of his views, but the conclusion that I myself have come to by my own studies of the facts in the light of Freud's teaching. Certain unconscious mental activities were at one time conscious and have later ceased to be accessible to conscious attention through incompatibility with the main personality: but other such activities may never have reached consciousness, partly through incompatibility and partly through lack of adequate stimulus, *e.g.*, certain powers of ethical and æsthetic insight and activity. The unconscious also may include repressing forces themselves. The forces of repression may sometimes be conscious forces. It may be assumed that in the early life of the individual a good deal of conscious repression occurs. But to a great extent such repression is unconscious. There is a part of the mind—the ego-ideal, super-ego, or censorship (these seem synonymous terms with Freud)—which is unconscious itself, and prevents other unconscious mental processes from becoming conscious. There is not only a repressed unconsciousness, but an unconscious repressing of the unconscious. If we consider the

problem of repression in early childhood, we shall see that we are in a false position if we think of the original repression as even mainly conscious, because in that case we are throwing back to the tender years of childhood mental stress and strain far greater than we would expect even the grown mind to stand and bear up against. These repressions in early childhood must themselves have been unconscious rather than conscious. Repressed interests in the other sex, repressed interests in the members of the family, etc., are repressed in an unconscious way. We cannot believe that the individual has actually experienced intense love for one parent, and hatred and jealousy for the other, and then through his own force of character and strength of mind has repressed these tendencies and changed them to something different. The repression must itself be unconscious. Whether in some bygone age there has been conscious repression is a debateable question.

The situation is analogous to that touched on by Aristotle in his doctrine of Responsibility. We praise or blame people, he said, for what they do; they do things because of their character. They are responsible for their character, their character is the result of the building up of habits of action on the basis of circumstances and heredity, and we are thus thrown back to earlier and earlier years for the source of this responsibility. We find that we are led to attribute responsibility most definitely at the earlier stages of character-formation, when the child is least able to bear such responsibility. We must avoid such an impression as that, and we may do so by admitting that early repressions may be entirely unconscious. Such unconscious repression is, no doubt, a matter of mental incompatibility, but its implications are far-reaching, and have not yet been adequately thought out. Pure theory and the acceptance of this position will cause us to modify the Freudian explanation very considerably, quite apart from actual direct evidence. If we look for evidence through psychoanalysis, we have to keep our minds open to the possibility that the process of psychoanalysis itself may produce conscious changes that were never real occurrences in the child's mind, but rather the product of unconscious potentialities in the child, in interaction with much more recent direct experience. We can assume that in this analysis, if we go back and back, we are eliminating the effect of later experience, but we cannot be sure that apparently sex experiences in early childhood were really in that form at that time, and have not been coloured by more recent experience of a sexual nature. That is one great difficulty in this whole line of thought.

What we can say is that since analysis does help the individual in the way of giving him the opportunity to work out certain tendencies, although the actual conscious experience he enjoys in the course of the analysis may not have been more than merely potential in the beginning, yet there is some potentiality in him that needs this outlet. Each individual has a number of potential selves, and he is enabled to harmonise them with his actual realised experienced self by giving them outlet. The person who is himself not

consciously artistic may in analysis display a great deal of artistic interest, indicating artistic potentialities in his unconscious which have been denied expression under the conditions of his ordinary waking life. There is not only a potentiality for things like that, but a potentiality for things harmful, which might influence his conduct and judgement if allowed an outlet. Take an extreme case of homicidal tendencies; they may be there unconsciously, they may never have shown themselves in consciousness, but yet may have influenced the patient's conduct and have had something to do with feelings of hate and tendencies to destructiveness which he occasionally has had; and in the course of an analysis they may come out more clearly, especially in dreams. He may work clear of this potentiality; having seen it in its full reality, he can, as it were, abjure it more completely. These early tendencies of the mind may be unconscious.

But among these there is a very pronounced tendency which has an important bearing on personality—the tendency to identification. The young child has a strong tendency to identify himself unconsciously with people he is fond of and admires. He takes them into his mind, as it were; the 'ego-ideal' or super-ego begins to grow in early years, modelled on the nature of the father or the mother or others of his immediate surroundings. Later on it becomes a more conscious identification. With the school-child there is a great deal of hero worship which plays its part in determining the ego-ideal. Besides this there is laid down in very early years a sense of conscientiousness, which according to some writers is a reaction to inimical feelings. A child may feel not only identified with his father, but may also feel repugnance to his father because he wishes his father out of the way in relation to the mother, and develops towards the father an identification, and also a feeling of hatred. This combination of identification and antagonism is responsible for the beginnings of a feeling of bad conscience. Such is the explanation given by some pyschoanalysts of the doctrine of the Atonement—a sense of sin and a need for being at one with God. The conception of God arises out of the earlier feelings towards the father and carries with it the germ of conscientiousness. This form of conscientiousness, which is unconscious conscientiousness, may show itself in mental disease. Later on, one may find such people falling ill of melancholia, and imagining that they have sinned against the Holy Ghost, where analysis, instead of diminishing the feeling, intensifies it. The patient becomes more and more conscientious, and this becomes more intense because it wells up from the unconscious, and may stand in the way of cure. The patient is so conscientious that he feels that he does not deserve to get well. The resistance here is very different from the ordinary resistances we meet with in the course of analysis.

In the psychopathology of personality, a phenomenon which has always bulked large is the dissociation of personality. Pierre Janet's theory of dissociation is the obverse or complement of his theory that the normal

personality is a unitary system of psychophysical tendencies and powers, which may break up into its component parts under certain conditions. And in the earlier history of Freudian doctrine we find Freud explaining the dissociation of personality in terms of mental conflict and repression. Certain parts of the mind split off from the rest because of incompatibility with the main parts. In Freud's recent work, *Das Ich und das Es*, he makes the further suggestion that the foundation of dissociation of the personality may well be looked for in these early tendencies of individuals to identify themselves with different types of character. Such various identifications may not be in full harmony with one another, and tend so to fall apart. The individual may identify himself with Napoleon or the martyrs, or St. Francis, and he certainly has a strong tendency to identify himself with his father and mother. And in cases where these characters are different, especially where there is strife at home, the strife is internalised in him. He takes the family strife into the depths of his own character. There is the lack of at-one-ness which may not be apparent in earlier years, but which may show itself later when he has to choose a career and face the problems of adult life.

The general trend of all psychological discussions of personality is in terms of multiplicity—looking for unity as a result of interaction between the many, instead of regarding the unity as something ultimate. This theory is not a proved fact. We always have before us the opposite possibility that the mind may be a unity from the earliest times, but under the influence of conflict and strife, and the conflicting claims of one's environment, lack of unity is introduced into the personality. The problem to decide in the end is as to which is the more ultimate, unity or multiplicity. The unity of the developed adult mind is to a great extent an acquired unity. But we have further to ask the question whether that acquired unity, the result of training, centres round an ultimate unity or an ultimate multiplicity. Undoubtedly we are multiple as well as unitary, but the feeling of unity is certainly there at every moment of consciousness. Although there is multiplicity there is also unity, and often a person who is alienated from himself and feels 'beside himself,' can only feel 'beside himself' because he is a unity. If he were not a self he would be unable to feel alienated from himself. From day to day our mood changes, we pass through stages of unconsciousness, but we wake up to a feeling of some identity with our past. A materialist would say that this is a simple consequence of the identity of the body. Not so: we pass in the argument to identity of the body from identity of the self.

We can say that nothing in psychopathology forces us to surrender a belief in the unity hypothesis. We cannot say that the unity is proved, but it remains not only a possibility but a probability. A mind is one from the start, but although its aspects then are fewer than they become in later life, and in old age they may seem to diminish, there is the possibility that the self is something beyond the phenomenal, owing its apparent multiplicity to

the conditions of its physical existence, but able in its unity to survive bodily death. We simply do not know. If psychical research could prove the survival of character and personal identity it would greatly increase our belief in the unitary nature of the self. One often finds people saying that researches in personality prove that the mind is not a unity, but those who study these cases closely at first hand are the first to admit that the multiplicity is less fundamental than the unity. Although there may be a break in the memory, so that when the person is in one psychological state he has no access to memories to which in another state he has access, that is not derogatory to the reality of his unity. We observe the same in the most normal person, who finds from day to day the scope of his memory varying. On certain occasions he finds certain memories associated with certain interests very readily accessible to him and others accessible with difficulty or not at all. The fact that we can say these interests are not in harmony with one another in ourselves shows that there is an underlying unity. If we set one desire, ambition, and mood against another, and realise their incompatibility, in that very process we are forming or rather emphasising an underlying unity.

Theoretically, at any rate, all the probabilities are in favour of ultimate unity. We are told to watch a young child and see how slight a unity there is. The child's interest flits from one thing to another, passes from laughter to tears, is ready to forget what has occurred a moment ago, but the fact that he can gradually synthesize these moods and hold in the unity of his consciousness a larger and larger field of psychological tendencies and make it into a system, shows there is something there beyond and at the back of his experience. The experiences do not come together of their own accord and join up into a unity. One can observe plainly the work of association, but as one observes that, one is forced to contrast it with the deeper and more thorough-going forms of unification of the mind, and recognise in spite of our changes that there is and has always been a continuity. If we turn to the animal world we may prefer to say with William James that the only unity is the unity of the "passing thought" that connects what has gone before with what comes after. "Every thought is born an owner and dies owned," to quote James's phrase. That is not convincing. If we start from that we cannot understand the higher unities of the mind. And indeed it seems to me that the results of psychoanalysis itself show an underlying thorough-going unity. The patient's mental development has been distorted, twisted by different forces, conflicting influences, and under analysis he gets free from these influences, and yet there is something left behind—the more normal self. The person becomes more normal because there was a normal unitary self all through. Though there was a tendency to multiplicity, the analysis itself has diminished that. And we might go further and say that even the person who has to spend his last years of life in an asylum in a completely alienated state of mind may hope to regain his freedom and real self at death. Although psychoanalysis

is not capable of undoing the facts of heredity, yet this twisting and strain is a matter of the mind and body rather than of the mind itself.

If the reader has followed what I have been trying to express, he will realise that this is certainly my own view. The perfectly normal mind is in direct relationship to the world about it ; its perceptions and its appreciations of value are direct revelations. It is through stress and strain in the physical organism that it gets a distorted view of things and is kept back from adequate appreciation of beauty and truth. Although the body seems to serve as an instrument to bring the individual into relationship with those realities, it is quite as much something that stands in his way. Difficulties are produced in the body. The body working at its best is an instrument which reveals to him a reality outside, and in doing so it does not make any contribution itself. The person whose brain is working quite normally is not conscious of the different organs of his body. It is often said that the *joie de vivre* of a perfectly healthy normal person is based on organic sensations from the smooth functioning of the body. This is a possibility but by no means a certainty. We are not forced to accept a view like that. The genuine pleasure of being really in touch with things may be a purely mental feeling.

Nothing we can learn from physiology and biology prevents us from believing in mental entities in relation with physical structures. Take an extreme case. Take the case of the feeble-minded, of idiots. There the general doctrine is that it is a deficiency, a lack of certain parts of the brain, so that a person is unable to live a full and complete life. Certain ranges of existence are withheld from him. He is unable to pass beyond the most primitive level of morality or intelligence. But the same situation is explicable in terms of a faulty instrument. Through lack of some power of the instrument, other parts of the instrument are not able to function, and so the mind cannot get into touch with the external world. Why a person should be abnormalised in that way is, of course, a serious problem.

While considering the pathological and the normal, we have borne in upon us the parallelism between pathological states and corresponding normal states. Take the higher and lower states of mysticism. There is a form of mystical experience which is pathological as well as one which is pre-eminently normal ; such is the mystical experience of the hysterical, who sees pictures in the clouds, etc. The individual is not in direct communion with ultimate reality, but suffers from a disturbance of the instrument which should bring him in touch with reality. In all true religious experience it looks very much as if we come into touch with the spirit of the universe within ourselves rather than outside ourselves. Each one of us is in direct relationship through his own subconscious with the divine, and our view of religion is blurred and obscured by our complexes, the twists in our character, and the unfortunate experiences that disturb our belief. That is the reason why analysis and autognosis will increase a person's power of experiencing genuine religious

feeling. A patient will tell one that after a time in the course of his psychotherapy he has reacquired the power of prayer that he had lost.

Here, again, one is always confronted with the alternative possibility that religion is an infantile thing, primitive, undeveloped, and in analysis a person is taken back to his childhood, to primitive credulity, to the trustfulness of the young child which is undeveloped and needs to be corrected by experience. Surely we can allow for that, and admit that there is infantilism in religion as experienced by the ordinary man which stands in the way of his clear religious vision, and yet that true religion itself dates back to the earliest years. It is the trustfulness and faith of the young child—call it primitive credulity, if you like, not merely ideomotor action but a direct awareness. The child is aware of something beyond itself even in its earliest years. That may later on through experience become repressed, and with analysis may come back. I am strongly against any criticism of psychoanalysis from the point of view of the risk of its endangering religious belief. When carried out by inexperienced or otherwise unsuitable people there may be some danger; but if carried out with due regard to the needs of the situation, there is none.

FACIAL PARESIS AS A MANIFESTATION OF TUMOURS OF THE UPPER HALF OF THE CERVICAL SPINAL CORD.

By WALTER M. KRAUS and
NATHANIEL E. SILVERMAN, New York.*

The signs and symptoms of tumours of the upper four segments of the cervical portion of the spinal cord are both varied and numerous. This portion of the cord is not only the crossroad for pathways to and from the brain, but contains centres and tracts which have to do with the functions of certain cranial nerves, the sensory fifth, the vestibular and gustatory system. The diagnosis of tumours in this region is often very difficult. The clinical picture may be first manifested by such lower level symptoms as sciatic neuralgia. It may, on the other hand, present, among others, the clinical pictures of cerebral hæmorrhage, hereditary ataxia, combined sclerosis, Pott's disease, and pachymeningitis.

The variety of involvement of various cranial nerves described is striking. Choked disc, pupillary inequality, facial sensory disorders and absence of the corneal reflex, nystagmus and absence of the pharyngeal reflex have all been recorded. But the finding of facial paresis has been unusual and very little emphasized. We have found it referred to in Elsberg's book[1] in two cases only.

The material which we have analysed in order to ascertain whether this finding is usual consists of ten cases of cervical tumour, of which two were confirmed at autopsy (one extramedullary, one intramedullary). In seven of these cases, including the two autopsied cases, a lower facial paresis was noted. The facial nucleus and nerve were examined in these two cases, and found to be normal. There was no pathological evidence of tumour or of meningitis above the foramen magnum which could account for the paresis. The tumours in five of the seven cases were extramedullary, and in the other two, intramedullary.

These observations are not altogether easy to explain. The question of hereditary or acquired non-paralytic asymmetry can be ruled out. Previous disease which could have caused facial paralysis of the two recognised types, central and peripheral, was not present. Furthermore, the paralysis of the lower half of the face which was found precludes these types of paralysis,

* Read before the New York Neurological Society, 4th May, 1926. From the Neurological Service, Montefiore Hospital, N.Y.

since it involves neither all of the facial muscles on one side as in the peripheral type, nor all of the infraocular muscles as in the central type, but is limited to the infrabuccal group. In none of the autopsied or non-autopsied cases was there any evidence of disease in the neighbourhood of the seventh nucleus or of its fibres and nerves.

We believe that some light may be thrown upon the matter from a consideration of the sensory supply to the face, the pathway of taste, and the comparative anatomy of the facial musculature.

The sensory supply to the face, head, and neck is derived not only from the trigeminal nerve, but also from the cervical plexus. The facial musculature is sometimes affected in lesions of the trigeminal nerve, reflexly. We have wondered whether the same may not occur when the cervical roots, and thus the sensory supply to the lower parts of the face, of the neck, and the back of the head are affected.

Another possible reflex pathway is through the gustatory system. This descends into the upper cervical region as the solitarius bundle. That impulses of taste produce movements of the facial musculature is well recognized. While in Utrecht visiting Prof. Cornelius Winkler's clinic, one of us (W.M.K.) saw a moving picture of an anencephalic infant in which quinine painted in the mouth produced an expression of displeasure, sugar an expression of pleasure. Moreover, we are well aware of similar pseudo-affective reflex movements, from the records of reaction of decerebrate animals (Bazett and Penfield[2]) and we know man responds in the same way, 'making a face' when he gets a badly-tasting mouthful. However, no evidence of taste disorder was recorded in our cases.

We mention all this without being in any way convinced that a reflex through the gustatory system is responsible for the paresis, but merely to state the anatomical pathways which we have considered in our attempt to explain our findings.

The comparative anatomy of the facial musculature throws some light upon the subject. The facial musculature is a derivative of the second hyoid arch and is part of the branchial muscular system. It has developed from the sphincter colli of fish and amphibia. It is also the only remaining part of the dermal musculature, a part of the body musculature which is skeletal in origin. In some animals this musculature envelopes the entire body, as in the hedgehog; in many, as the horse and cow, it is very extensive, and is the musculature which removes flies and other irritative things from the body by a twitch movement. In man, this musculature, the platysma, is limited to the head and neck and extends a variable distance downward on the front of the chest, as far as the nipple line in some. From the mouth downwards this muscle sheet is the most cervical portion of what remains of this dermal system of muscles, so much more extensive in many lower animals. Even in man it lies far below the anatomical limits of the head.

There is no evidence to show, from any viewpoint at present available, that the lower portion of this dermal musculature has a double nerve supply, i.e., spinal as well as by the seventh cranial nerve. No supply analogous to the double supply of the sternocleidomastoid has been shown.

We are left, therefore, with the idea that a reflex pathway within the nervous system from the cervical segments is the most probable cause of the facial paresis which we have found in tumours of the upper four cervical segments.

Further evidence, of a negative character, is that this paresis has not been observed in tumours below the fourth cervical segment, either in our series or the cases reported by Elsberg. Whatever centre or pathway is responsible for the sign is not present below C4.

That not all of the cases (25 per cent.) showed this sign indicates that some specific mechanism is affected.

SUMMARY.

1. Paresis of the infrabuccal portions of the facial musculature may occur in association with tumours of the upper four cervical segments, and, per contra, no such paresis appears in cases of tumours of the lower four cervical segments.

2. In two cases of a series of ten high cervical tumours which were autopsied, one intramedullary and one extramedullary, the seventh nucleus was normal, and there was no evidence of any abnormality in its region, or above the foramen magnum.

3. In seven cases, five of which were extramedullary, from the Montefiore series, and in two cases, both extramedullary, recorded by Elsberg, this facial paresis was present. In three cases, one intramedullary and two extramedullary, from the Montefiore series, the paresis was absent.

4. The phenomenon is probably due to disorder of a reflex pathway originating in this portion of the spinal cord and extending to the facial nucleus.

CASE REPORTS.

CASE I. I. B.—*Diagnosis:* Extramedullary neoplasm, upper level at C2.
Flattening of left side of face, nystagmus, weakness of left sternocleidomastoid, hyperæsthesia beginning at C1.

Autopsy: Osteofibroma of odontoid process. Facial nucleus normal. No pathological condition above foramen magnum.

History: Until the age of fourteen patient was a weakling. In June 1919 he began to lose control of his sphincters. This recurred at intervals of about every four weeks. Admitted to Mt. Sinai Hospital in June 1920, where attacks of dyspnoea and priapism were noted.

Neurological examination: Fundi hyperæmic. Disc margins blurred. Right pupil larger than left. Slight flattening of left side of face. Nystagmus in horizontal plane. Laboured rapid breathing. Left sternocleidomastoid and trapezius weaker than right. Tongue tremulous but not atrophied. General motor power fair. Gait spastic and ataxic. Dysdiadokokinesis on both sides. Deep reflexes exaggerated, more on left

than right. Bilateral Babinski sign. Area of hyperæsthesia beginning at C1 and extending to C4, below which there is hypæsthesia. Perianal anæsthesia.

Autopsy revealed osteofibroma of odontoid process, compressing cord posteriorly; below, descending pyramidal demyelinization in both lateral columns and one anterior column. Above C1, degeneration of the columns of Goll and Burdach, and both dorsal spinocerebellar tracts. Sections at various levels through the seventh nucleus failed to reveal any abnormalities in cell structure.

CASE II. B. L.—*Diagnosis:* Intramedullary glioma, upper level at C3.

Drooping of left angle of mouth; hyperæsthesia beginning at C3.

Autopsy revealed intact seventh nerve nucleus. No pathological condition above foramen magnum.

History: Patient, age 61; present illness began in 1910 with severe cervical pain radiating to shoulders, followed by loss of sensation and by spastic paraplegia. Atrophy of muscles of left upper extremity. Hyperalgesia beginning at C3 and extending to C5 Hypalgesia and analgesia below.

Neurological examination: On admission, weakness of lower facial muscles on left with droop of angle of mouth. Marked spastic paralysis of both lower extremities. Upper extremities showed diffuse atrophy from shoulder girdle to hand. Bilateral Babinski sign; patellar and ankle clonus. Abdominals absent. Beginning at C3, there is hyperalgesia, with analgesia below C5 (temperature and touch).

Autopsy revealed an egg-shaped grayish tumour, covered anteriorly by a thin layer of cord tissue, occupying third, fourth and fifth cervical segments. No abnormalities of dura externally. Sections at levels through seventh nucleus revealed normal cellular structure. No other pathological changes above foramen magnum.

CASE III. M. N.—*Diagnosis:* Inoperable intramedullary glioma, upper level at C3.

Flattening of left face, nystagmus in right plane, slight ptosis of left eyelid, corneal hypæsthesia, pharyngeal and palatal hypæsthesia, hyperæsthesia beginning at C1.

History: Patient, age 16, female; present illness began 15 months before admission with weakness of left lower extremity and incontinence of urine; shooting pains at the back of the neck, weakness of left arm.

Laminectomy revealed intramedullary tumour.

Neurological examination: On admission, slightly irregular pupils, slight ptosis of eyelid, bilateral corneal hypæsthesia, left facial flattening, nystagmoid jerks in right lateral plane, slight pharyngeal hypæsthesia. Upper extremities, loss of voluntary power, bilateral wrist drop with atrophy of hand muscles. Level of hyperæsthesia and hyperalgesia, upper limit at C1, involving several segments. Sensation lost in lower extremities and greatly diminished in the upper. Bilateral ankle clonus and Babinski sign. Knee jerks exaggerated. Abdominals absent. Laboratory findings negative.

CASE IV. J. B.—*Diagnosis:* Endothelioma, upper level at C2.

Drooping of left angle of mouth, slight rotatory nystagmus, strabismus of right eye, right pupil larger than left, palatal reflex absent, hyperalgesia beginning at C3. Operation and removal.

History: Onset of illness eight months before admission, with sharp, lancinating pains along ulnar side of left hand soon followed by pain in left hip, travelling down leg. Difficulty in micturition and in walking.

Neurological examination: Right pupil larger than left, convergent strabismus of right eye, drooping of left angle of mouth, slight rotatory nystagmus and slight deviation of tongue to right, with fine tremor. Spastic gait; dragging of left foot. Marked wasting of musculature of upper extremities. Bilateral hyperreflexia. Abdominals absent. Babinski response on left. Hypalgesia below C3.

Operation: Endothelioma removed, upper pole extending to C2; attached by two posterior roots on left.

CASE V. A. P.—*Diagnosis:* Inoperable intramedullary glioma, upper level C3.
Paresis of lower right facial muscles, left corneal hypæsthesia, weakness of right sternocleidomastoid, hypalgesia below C3.

History: Patient developed stiffness in back of neck radiating to shoulders, which was soon followed by a subjective feeling of tightness in epigastrium and by tympanites. Legs and arms became weak; difficulty in micturition. Operated on at the Neurological Institute by Dr. Elsberg; cord found to be greatly enlarged.

Neurological examination: Right pupil larger than left. Left corneal hypæsthesia. Paresis of right lower facial muscles. Slight deviation of tongue to right. Upper extremities; atrophy of the pectoral girdles and weakness. Lower extremities; markedly diminished power, with hypotonia. Biceps and triceps reflexes greatly diminished. Tendon reflexes in lower extremities exaggerated, bilateral Babinski sign, ankle clonus, absent abdominals. Hypæsthesia below C3; hypalgesia and loss of vibratory sense below D4.

CASE VI. J. L.—*Diagnosis:* Extramedullary neoplasm, upper level at C4.
Immobility of left angle of mouth with slight flattening of left face, right pupil larger than left, hyperalgesia beginning at C4.

History: Patient, age 55; present illness began about ten years ago with pain in the lower cervical spine and progressive weakness of legs.

For three months before admission he was dyspnoic and had poor sphincteric control.

Neurological examination: Some immobility of the left angle of the mouth and slight flattening of left side of face; right pupil larger than left; tongue slightly tremulous. Lower extremities spastic; power greatly diminished. Upper extremities not affected grossly. Level of hyperalgesia at C4, C5 and C6, with hypalgesia below. Bilateral Babinski; ankle clonus. Biceps and triceps jerks exaggerated.

A diagnosis of extramedullary neoplasm was made. Patient refused operation and left the hospital unimproved.

CASE VII. A. K.—*Diagnosis:* Extramedullary neoplasm, C3–5.
Flattening of right cheek, divergent right strabismus, hypæsthesia below C3.

History: Patient, female, age 48; present illness began five years before admission with gradual development of pain in back of neck radiating up back of head and followed by stiffness of neck. Gradual weakness and stiffness of the right arm. Legs stiff and weak, more marked on the right side. During the last year, some difficulty in sphincteric control.

Neurological examination: Flattening of the right cheek. Inability to move head, especially to the right. Right arm held extended, with fibrillary twitchings and atrophy of shoulder girdle.

Lower extremities, flaccid paraplegia with double foot drop. Hypæsthesia below C3.

A diagnosis of extramedullary neoplasm from C3 to C5 made.

Patient died of uræmia; no autopsy.

CASE VIII. C. C.—*Diagnosis:* Intramedullary neoplasm, upper level at C2–4.
Slight drooping of left eyelid, slight deviation of tongue to left, hypæsthesia beginning at C3.

History: Patient, male, age 44; present illness began five years before admission with numbness in fingers of left hand, followed by numbness in right. One year later he developed stiffness and difficulty in walking, which soon became impossible. Upper extremities became very weak and stiff so that he was unable to feed himself. Four months later he began to lose bladder control.

Neurological examination: Left pupil larger than right, slight drooping of left lid, slight deviation of tongue to left. Marked weakness of both upper extremities, with fibrillary twitching and wasting. Lower extremities, bilateral spastic paraplegia. Deep reflexes of upper and lower extremities exaggerated. Abdominal reflexes absent. Bilateral Babinski sign and clonus. Hyperæsthesia at C3, with hypæsthesia below. Patient developed a temperature of 104°F., with dyspnœa, and death ensued. No autopsy.

X-ray revealed irregular bone destruction in transverse process of third cervical vertebra on the right, associated with bony arthritic changes.

CASE IX. S. B.—*Diagnosis:* Extramedullary neoplasm, upper level at C1.

Insufficiency of convergence; jaw deviation to right, bilateral corneal hypæsthesia, slight deviation of tongue to the left, hyperæsthesia beginning at C2.

History: Patient, female, age 39; onset of present illness about one year ago, with hoarseness and difficulty in articulation. The dysarthria was apparently due to dyspnœa rather than to definite involvement of the glottis. About three months ago occasional regurgitation of the food through the nose occurred. Weakness and stiffness of the right lower and upper extremities developed.

Neurological examination: Slight prominence of right eye, right pupil larger than left, some insufficiency of convergence; the jaw opened with some difficulty and deviated to the right. Bilateral corneal hypæsthesia. Air conduction greater than bone on the left. Tongue deviated slightly to the left, with a few fibrillary twitchings. Generalized hyperreflexia more marked on the right. Bilateral Babinski sign; ankle clonus on right and on left; area of hyperæsthesia in the distribution of C2.

Diagnosis of neoplasm (inoperable) of C1 and C2 made.

Patient discharged unimproved.

Laboratory findings were essentially negative.

CASE X. D. G.—*Diagnosis:* Extramedullary neoplasm, upper level C3–4 (clinical).

Nystagmus in right lateral plane, pharyngeal reflex diminished, tongue deviation slightly to right; hyperæsthesia beginning at C3.

History: Patient, male, age 45; present illness dates back nine months before admission, with pain in the left side of the neck which became so severe that it necessitated staying in bed. Soon after he noticed pain with a feeling of heaviness in the left arm, then weakness developed in left leg.

Neurological examination: Nystagmus in the right lateral plane, pharyngeal reflex diminished, slight protrusion of tongue to the right. Patient had a typical gait of a left hemiplegic, with limited movement of left upper extremity. Marked contracture at the elbow and flexion of fingers, atrophy of the left shoulder girdle. Movements of the neck not restricted. All deep reflexes exaggerated, with patellar and ankle clonus on the left but not well sustained on the right. Bilateral Babinski sign. Hyperalgesia on the left below C2, hypalgesia on the right below C2. Vibration sense impaired below clavicle on both sides. Diagnosis of extramedullary neoplasm at C3–4 was made. Operation was advised, which was refused by the patient, and he was therefore discharged unimproved.

CASE XI.*—*Diagnosis:* Extramedullary sarcoma, C1–4, presenting clinical picture of cervical spondylitis.

Slight weakness of right facial muscles, nystagmus to the right. Operation and recovery.

History: Patient, male, age 24; present illness began fourteen months ago with severe pains in the right shoulder. These gradually spread to the small of the back, and to the right hip and thigh. Right upper extremity became weak.

X-ray examination at that time revealed arthritic changes of the cervical vertebræ, and the case was treated as one of cervical Pott's disease.

Four months before operation the symptoms advanced rapidly, with loss of power of the right and then of the left lower extremity, and later of the left upper extremity. At first retention of urine, later incontinence. Bowels obstinately constipated.

Neurological examination: Distinct nystagmus to the right; slight weakness of the facial muscles. Breathing abnormal in character. Marked wasting of both shoulder girdles, more marked on the right, and atrophy of intrinsic muscles of hands. Motor power of all extremities diminished; right upper limb totally paralysed. Reflexes of right upper extremity not elicited, much diminished on the left. Abdominals and cremasterics absent. Reflexes of lower extremities increased, with bilateral Babinski sign and ankle clonus. A belt of hyperæsthesia round the entire neck and upper chest. Hypalgesia from C3 to L3, and analgesia below.

X-ray, arthritis of cervical vertebræ.

Operation: Laminectomy. Neoplasm exposed, extending from the fourth cervical segment to the foramen magnum.

Biopsy showed spindle-celled sarcoma.

CASE XII.*—*Diagnosis:* Extramedullary myxosarcoma, C4–7.

Pupils unequal, right larger than left, slight left facial weakness, left recurrent laryngeal paralysis, hypalgesia below D5.

History: Patient, male, age 59; symptoms began seven months before admission, with pain in the left shoulder extending down the arm. This was soon followed by weakness and atrophy of the limb. Four months later, girdle sensations round upper abdomen, followed by weakness of lower extremities, left greater than right. Increased frequency of urination.

Neurological examination: Pupils unequal, right larger than left; slight left facial weakness; left recurrent laryngeal paralysis; marked atrophy of left upper extremity and weakness. Biceps and radial reflexes not elicited. Triceps jerk very weak on left, but lively on right. Abdominals absent. Reflexes of lower extremities exaggerated with ankle clonus and bilateral Babinski sign. Some hyperæsthesia over upper chest. Pain and temperature senses diminished below level of fifth rib.

X-ray, spondylitis of cervical vertebræ.

Operation: Bluish tumour mass, 4 cm. long, extending from the fourth to the seventh cervical segment. Cord considerably flattened and pushed to the left.

Examination of tumour, myxosarcoma.

REFERENCES.

[1] ELSBERG, *Tumours of the Spinal Cord*, 1925.

[2] BAZETT and PENFOLD, "The decerebrate animal in the chronic and acute condition," *Brain*, 1922, xlv, 185.

* Taken from Elsberg's *Tumours of the Spinal Cord.*

Short Notes and Clinical Cases.

A NOTE ON THREE CASES OF DISSEMINATED SCLEROSIS ASSOCIATED WITH EPILEPSY.

By F. J. NATTRASS, Newcastle-on-Tyne.

While the true nature of 'idiopathic' epilepsy remains obscure, the number of organic nervous diseases in which some variety of epileptic attack is recognised as a symptom is steadily increasing. In the issue of this Journal for August 1925, S. A. Kinnier Wilson and H. J. MacBride drew attention to the association of epilepsy with disseminated sclerosis, giving details of eight recorded cases and of seven cases personally observed by them. This association is of such obvious importance and clinical interest that it seems desirable to put on record three other cases which I have observed during the past few months.

CLINICAL HISTORIES.

Case 1. Disseminated sclerosis associated with Jacksonian epilepsy. Male, age 32; motor driver.

History: In the summer of 1924 this man was off work for seven weeks on account of numbness from the waist downwards, with some weakness of the legs and a tendency to stagger. He appeared to recover completely and did his usual work for a year, but in July 1925 he complained of double vision which lasted for four days and made it necessary for him to wear a shade over one eye. In August 1925 he suddenly began to suffer from attacks of twitching on the right side of the body, and these recurred daily for a fortnight before he came under observation. He was admitted to hospital, where many typical attacks of rightsided Jacksonian epilepsy were observed. The attacks were very brief, lasting about half a minute, and there was no loss of consciousness. The movements affected simultaneously the hand and the angle of the mouth, the leg being only slightly involved; during the attack, and for about a minute after, the patient could not speak, and for some minutes after there was numbness all down the right side of the body. From twenty to forty of these attacks occurred daily for ten days after admission, when they ceased abruptly and have never returned. No family history of epilepsy could be obtained.

Examination at the time of admission: There was slight dysarthria: slight lateral nystagmus was present, the knee and ankle jerks were very active, and the abdominal reflexes were absent. The plantar reflexes were flexor. The Wassermann reaction was negative in the blood and cerebrospinal fluid. The patient complained of dryness of the mouth and was found to be suffering from diabetes; sugar and acetone were present in the urine, and there was a moderate degree of hyperglycæmia with a typical curve (rising to 0.300 per cent. one and a half hours after 50 g. glucose).

Present Condition: Diabetes under control by diet and insulin. Patient is bedridden by extreme weakness and ataxia; mental state optimistic and suggestive of the disease; speech scanning. Distinct pallor of optic discs; well-marked nystagmus of cerebellar

type, chiefly on conjugate deviation to left. Intention-tremor of both upper limbs. Abdominal reflexes absent. Knee and ankle jerks active; plantar responses both extensor.

CASE 2. Disseminated sclerosis: onset with generalised epileptic attacks. Male, age 24; shop assistant.

History: In March 1923, at the age of 21, the patient began to have fits: he was previously in normal health and had no fits in infancy or childhood. No family history was obtained of any similar affection. He has since had nine similar fits. The attack occurs suddenly with no warning; one attack occurred when he was asleep in bed and his brother, sleeping beside him, was wakened by a gurgling noise. He loses consciousness completely and "goes stiff," but is said to lie still and no twitching of the limbs has been observed. He snores loudly during the attack. He does not know if he changes colour but after one attack his left eye was "filled with blood." Two or three times he has vomited violently after an attack and he is always left drowsy and with a severe headache, and is unable to recognise anybody for about twenty minutes. In December 1924, one year and nine months after the first fit, he complained of numbness of the right side of the face and the right arm and leg, with some weakness and dragging of the right foot; this lasted for four days and then passed off. In June 1925 the numbness of the right side of the body returned, and he came to hospital complaining of this. He then stated that the vision of the left eye had become defective and that he had recently had double vision lasting for a week. He said further that he had felt some slight quivering at times in the right arm, and that he was subject to occasional headaches over the right temple.

Examination: Nothing abnormal was found in the optic discs, but there was well-marked nystagmus on lateral deviation to right and left, with a quick outward phase and slow recession. There was also slight dysarthria. There was some swaying of the extended right arm with the eyes closed, and diminution of the power of grip in the right hand. The tendon reflexes were very active, and greater in the right limbs than the left; the plantar reflexes were indefinitely flexor with a tendency to extension, and the muscular tone of the right lower limb was increased. The upper abdominal reflexes were barely obtainable, and the lower abdominal reflexes were absent. There was profound astereognosis in the right hand, and considerable loss of muscle sense in the right leg. The Wassermann reaction of the blood was negative.

Present Condition: A month after the first examination marked improvement had occurred. The partial right hemiplegia had cleared up and the astereognosis in the right hand had almost disappeared. Some pallor of the temporal sides of the optic discs was noticeable, however, and this is more evident at the present time. Slight nystagmus is still present, and the tendon reflexes remain abnormally active but the plantar responses are flexor; the abdominal reflexes remain faint but are elicited more easily on the right than on the left. The patient now complains of slight numbness in the left limbs and trunk, but apart from this the remission of symptoms and physical signs is remarkably complete.

CASE 3. Disseminated sclerosis; onset with petit mal seizures. Female, age 19; domestic servant.

History: In February 1926 this patient began to have 'fainting attacks.' The first attack occurred when she was washing windows; without any warning she "turned helpless" and fell off the steps on which she was working. Since then she has had eleven similar attacks. The history is difficult to elicit; the patient does not think she loses consciousness, and the attack is over in less than a minute. There is no convulsion or twitching of the limbs. After she "comes out" she feels weak and has to remain lying down. Two or three attacks have occurred when she has been sitting at meals or reading; she has fallen backward in the chair for a moment and then "come out" of the attack. Except for these attacks the patient feels quite well and has had no previous illness of note; there is no family history of epilepsy.

Present Condition : The patient has been examined on several occasions since she first attended hospital in April 1926, three months after the onset of the attacks. Her general condition is good and she does not appear of a nervous temperament. There are no signs of disease in the heart, lungs or abdomen. At the first examination the optic discs and other cranial nerves appeared normal, and the only abnormalities detected were a left extensor plantar response and weakness of the abdominal reflexes ; these reflexes tired readily and were weaker on the left side. The left plantar response has remained consistently extensor. The right plantar response has changed in character, and while usually indefinitely flexor was distinctly extensor on one occasion. There is now slight but distinct nystagmus on conjugate lateral deviation in both directions, with a quick outward phase and slow recession. The optic discs now show suspicious pallor of their outer halves, and there is slight weakness of the left angle of the mouth in both volitional and emotional movements. No alteration from the normal is noticeable in the tendon reflexes, and there is no inco-ordination and no sensory disturbances. The Wassermann reaction of the blood is negative.

DISCUSSION.

In Cases 1 and 2 the diagnosis of disseminated sclerosis would appear to be beyond doubt. The special interest of Case 1 lies in the development of Jacksonian seizures in a patient already the subject of disseminated sclerosis ; twelve months previously this man had transient numbness from the waist downwards, and five weeks before the onset of epileptiform attacks he had diplopia lasting for four days. Furthermore, at the time of onset of the seizures he had sufficiently definite physical signs of the disease. Wilson and MacBride saw no case, and found none in the literature, in which Jacksonian epilepsy supervened in an established case of disseminated sclerosis ; in all their cases the Jacksonian attacks were an initial or very early symptom.

In Case 2 generalised epileptic attacks preceded all other symptoms by nearly two years, and have continued to recur from time to time, while the symptoms and physical signs of disseminated sclerosis have advanced and remitted in characteristic fashion. Wilson and MacBride report one case in which generalised fits preceded any other manifestations of nervous disease by a considerable interval, and in this case the fits ceased some twelve months before evidences of disseminated sclerosis appeared. In another case (Chartier) which they quote, generalised fits were the first symptom, but there is no record as to whether they persisted in the later stages of the disease.

In Case 3 the absence of a history of definite loss of consciousness may be held to throw doubt on the nature of the attacks. Especially is this the case as Wilson and MacBride do not record any definite case of petit mal occurring in disseminated sclerosis, though they refer to one in which this combination appears probable. This case, therefore, is put forward with reserve. One can only say that the diagnosis of petit mal was made with considerable confidence from the history, and no suspicion of disseminated sclerosis arose until the routine physical examination revealed evidence of organic disease.

REFERENCE.

WILSON, KINNIER and MACBRIDE, H. J., "Epilepsy as a Symptom of Disseminated Sclerosis," *Journ. of Neurol. and Psychopathol.*, 1925, vi, 91.

Editorial.

THE METHODS OF NEUROLOGICAL RESEARCH.

IF activity in neurological research is to be gauged by the annual output of neurological literature, it may safely be declared to be in a flourishing state. Were the truth told, it would be admitted that no one can keep himself abreast of this production, in any literal sense, for the task of summarising and assimilating the unending series of papers, monographs and books dealing with aspects of neurology and nervous disease amounts to a practical impossibility. Journals in various languages endeavour to supply their readers with periodical *resumés* of the results of neurological investigation as they appear, yet even so it may be permitted to question whether the average worker is not so occupied with his own pursuits that he has little leisure for scanning and absorbing the discoveries of others. Every now and then articles of outstanding merit compel attention because of the real acquisitions to knowledge which they contain, and these eventually reach the stage of being incorporated in textbooks, but for one paper of this description there are ten or twenty which can scarcely be said to furnish any genuine contribution to neurological doctrine. Any attempt, however, to curtail literary activity in respect of neurological research would be at once inadvisable and impracticable. In not a few instances contributions of a minor character have as a fact paved the way for distinct advance, while many more ambitious communications are shown in the event to have led nowhere. The path towards the goal of exact knowledge is strewn with the bones of dead theories. It would be easy to provide illustrations of neurological hypotheses that have had their day and ceased to be. Who now hears of the treatment of tabes by dilatation of the urethra, or by suspension ? Who makes a diagnosis of urinary paraplegia, or of cerebral hyperæmia ? On the other hand, in many instances the accretions to knowledge have been so gradual that they are with difficulty assigned to any single contribution, having in some Topsy-like fashion really " growed."

More important than any criticism of the notoriously unequal value of average neurological articles is the necessity of correlating advances made by workers in differing departments of research in regard to the nervous system. That vast field is being invaded systematically and with unrelaxing industry by labourers who do not get sufficiently into touch with each other, at least in the earlier stages. The *Spirochaeta pallida* was the discovery of a zoologist, salvarsan of a chemist; and the clinician and the therapeutist have entered into their labours. Similarly, the neurophysiologist has on numerous occasions pointed the way to the practising neurologist and, unfamiliar though he may have been with clinical neurology, has builded better than he knew if we are to judge by the value of the application of his physiological investigations to the problems of clinical medicine.

Much of the ordinary teaching in clinical neurology to-day is the direct outcome of the physiological genius of Sir Charles Sherrington, and in like manner we may justifiably expect distinct gains, of a practical, clinical kind, from the physiological researches of Professor Magnus and his collaborators, recently embodied in his fine volume *Körperstellung*. There can be no doubt that clinical neurology has been to some extent transformed by coming into the heritage of the neurophysiologist; we have gained an insight into neural symptomatology which strictly clinical research would not have so readily provided. Fifty years ago knowledge in respect of the functions of the brain and cord was so limited that it was possible for an exceptional observer like Hughlings Jackson to deduce from clinical data alone physiological principles which were amply confirmed by subsequent investigation; yet even at that time it required the physiological labours of Sir David Ferrier and others to open the way for the clinician. And it is not derogatory to the place occupied by purely clinical methods to say that we are still indebted to the experimentalist for much that could scarcely be acquired by other means.

An entirely different line of research, that of the biologist and bacteriologist, has proved no less remunerative, scientifically and practically. The infective diseases of the nervous system, poliomyelitis, cerebrospinal meningitis, epidemic encephalitis, have yielded or will doubtless yield their secrets to the bacteriologist and the experimental pathologist. Much of the treatment of infective disease has been revolutionised through the work of the clinical and experimental laboratory,

and while an immense amount of inquiry still is requisite as far as some familiar nervous affections are concerned, their problems are now being approached in a more hopeful spirit. If we take as example the common nervous disease disseminated sclerosis, it must we think be acknowledged that the clinician and the morbid anatomist can hardly be expected to make any further contribution of significance. The clue to its still elusive secret lies in the hands of other investigators. It would be some consolation to the neurologist's *amour propre* were this to be discovered by one of ourselves rather than by a professional bacteriologist or experimentalist, for we do not like to think that we are doomed to depend in an ever increasing degree on the work of those who never come in contact with nervous disease clinically. Yet such, admittedly, has been the trend in recent years. After all, a healthy rivalry and not a green-eyed jealousy should animate us. The neurologist should be in a position to utilise the methods and technique of other lines of investigation for his own problems, and there are on record many instances of successful application of this kind.

Again, very distinct advance in clinical knowledge is to be attributed to the help which chemistry and biochemistry have given. Chemical methods have been of outstanding value, for an instance, in the study of the cerebrospinal fluid in nervous disease, and useful criteria of differential diagnosis have thereby been established. Nor is it necessary to do more than mention the indispensable nature of the chemical investigation of the blood serum for a large number of nervous syndromes as they are seen at the bedside. We are of the opinion, moreover, that recourse to biochemical method will eventually prove of assistance in the study of the great group of the myopathies and muscular dystrophies, and probably also of the degenerative diseases to which the nervous system, more than any other, appears susceptible.

If, however, the practising neurologist is thus very conscious of his dependence on lines of research, as regards some at least of his clinical material, which he himself may have neither the time nor the skill to pursue, it will be an ill day for him should he conclude this is tantamount to his relinquishing all thought of strictly clinical investigation. No advance along collateral paths can take the place of clinical study. The earliest manifestations of disease of the nervous system come under the notice of the clinician, who is thus in a favoured position and who has need of all his skill to detect and evaluate

their presence and significance. Examples might be cited of clinical discoveries having furnished suggestive points for physiological and other forms of research. Our knowledge of the functions of the basal ganglia is attributable almost entirely to the clinical and clinico-anatomical method; the syndrome of the optic thalamus, an important discovery, is the outcome of the clinician's acumen. The major part of the significance of clinical analysis of the symptoms occasioned by lesions of the corpus striatum and of the optic thalamus is constituted by the inferences drawn therefrom in regard to outstanding problems of cerebral physiology, and it is no exaggeration to claim that the technique of the experimentalist cannot help us much here and in any case cannot usurp the place occupied by clinical method. When we approach the field of psychiatry and of psychopathology, the latter is more than ever indispensable. Ingenious experiments on behaviouristic lines have been conducted on rats and other animals of a higher grade, and are not without meaning for the student of abnormal human behaviour, but such methods clearly have their limits. Disease is the great experimenter, and just as clinical examination of cerebral cases throws light on cerebral function so does clinical psychopathology provide us with a precious insight into the activities of normal psychological mechanisms.

The follower of the clinical method, therefore, need go through no self-depreciatory phase in these days of intense industry in other sections of the field of research. It was the aim of the late Sir James Mackenzie, pursued with unrelenting ardour to the end, to prove to all and sundry the pre-eminence of clinical inquiry. He used to tell with evident relish the story of the young medical graduate who after a year of indifferent success as assistant to a country practitioner intimated to the latter his intention of leaving it in order to follow his bent towards scientific research in a laboratory. The older man looked at him in silence for a moment or two and then said: "away you go and be a professor, for you'll never be a doctor."

Abstracts.

Neurology.

NEURO-ANATOMY AND NEUROPHYSIOLOGY.

[71] **The double autonomic innervation of voluntary muscles** (A proposito della doppia innervazione autonoma dei muscoli volontari).—G. B. Belloni. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 1.

A short review of recent communications on the subject and a refutation of the theory of Danielopolu based on the claims of Eppinger and Hess for a complete antagonism of sympathetic and parasympathetic activity. The author considers that evidence for sympathetic activation of striated muscle is sufficiently conclusive, but does not consider the pharmacological evidence for parasympathetic innervation at all convincing. R. G. G.

[72] **Observations on the relation of the sympathetic nervous system to skeletal muscle tonus.**—F. D. Coman. *Bull. Johns Hopkins Hosp.*, 1926, xxxviii, 163.

Stimulation of the sympathetic fibres to skeletal muscle has hitherto yielded only equivocal and unconfirmed results; a majority of observers find that elimination of the sympathetic fibres with preservation of cerebrospinal innervation has no effect on the tone of these muscles; finally, there is general agreement that definite loss of tone follows interference with the cerebrospinal reflex arc.

The author experimented on cats and dogs, observing the effect on tonus of the forelimb of (1) stimulation of sympathetic fibres passing to the limb; (2) ventral root section of spinal nerves of the thoracic sympathetic outflow; (3) ventral root section of cerebrospinal nerves forming the brachial plexus.

His conclusions are: (1) stimulation of the sympathetic innervation failed to cause any tonic reaction.

(2) Complete deprivation of sympathetic innervation to the foreleg failed to influence the normal development of tone either before or after decerebration.

(3) Complete deprivation of somatic motor innervation to the foreleg was followed by complete abolition of tone in that leg both before and after decerebration.

"The conclusion is evident, that there is no direct relation between the sympathetic nervous system and the development or maintenance of postural tonus in cross-striated muscle." S. A. K. W.

[73] **Muscular movement and its regulation.**—F. Wood Jones. *Med. Journ. Australia*, 1925, xii, 627.

Human voluntary movements consist in the cortical initiation of alterations in position of parts, the position in space of which is appreciated in the cortex. This the author believes to be very different from the movements of such an animal as a frog or even a typical mammal. In the one case posture and movement are inseparable concepts; the realization of posture is a necessary part of the mechanism of initiating movement. Posture precedes and results in movement. In the other case, posture and movement are separable; a realization of posture is not demanded in the initiation of movement; movement precedes and results in posture. There is that quality of the human realization of posture which forbids the belief that when a position has been assumed it is maintained by the sympathetic arc. Where human posture to be maintained by the sympathetic arc, then a patient upon whom ramisection has been performed should, like the de Boer frog, lose the posture the moment the movement had been effected. When the contraction tone has passed off, the limb should fall back again as does the frog's leg. The human cortex has usurped and unified too much to justify the expectation that human posture and movement can be sundered by the loss of sympathetic innervation.

Lewis Yealland.

[74] **Sweat secretion in man** (Ueber den Schweiszsecretion des Menschen) —Moog and Buchheister. *Münch. med. Woch.*, 1926, lxxv, 895.

These authors used Jürgensen's method of staining the sweat pores and making microscopical observations of the secretion of sweat. They found that on the hands and feet, at any rate, there was a slight continuous secretion, inappreciable by simpler means of examination. By subcutaneous injection of pilocarpine, the sweat glands could be rendered visible on all parts of the body and could be enumerated. The results obtained for various areas agreed with those of Krause. Atropin inhibits the "perspiratio insensibilis," and so does adrenalin; the latter acts thus on account of the vasoconstriction which it produces; the antagonism between its effect and that of pilocarpine is not the result of directly opposing actions on the nerves to the sweat glands. When ice was held in one hand, the activity of the sweat glands in the other hand was inhibited; this is attributed partly to direct reflex action on the sweat glands and partly to vasoconstriction. The influence of emotion on the sweat secretion was also observed.

J. P. Martin.

[75] **The effect of magnesium sulphate on the cerebrospinal fluid pressure and on the brain volume.**—E. J. Morrissey. *Arch. of Surg.*, 1925, xi, 778.

From a series of experiments, both on human cases and on dogs, the author finds that in man 45 gm. of magnesium sulphate crystals by mouth do not

cause a drop in cerebrospinal fluid pressure in two hours. A slight fall in intracranial pressure was noted in a few animals, coinciding with a fall of blood pressure. The injection of a " large amount " of magnesium sulphate into the small intestine does not change brain volume in forty minutes.

There is no experimental or clinical basis for assuming that the œdematous brain gives up fluid more readily or in greater quantity after the ingestion of magnesium sulphate than an equivalent bulk of other, extracranial, tissues. The effect of the drug is inadequate, and it should not be relied on seriously for the reduction of intracranial pressure.

Hypertonic sodium chloride, however, given intravenously, has an effective action in this respect. Spinal puncture has a similar action. In acute examples of intracranial pressure, some will be found to require a subtemporal decompression; in others, spinal puncture or hypertonic sodium chloride may be sufficient; in some others, a combination of these methods gives the best results.

J. S. P.

[76] **The significance of changes in the electrical resistance of the body during sleep.**—C. P. Richter. *Proc. Nat. Acad. Sci.*, 1926, xii, 214.

It has long been known that the electrical resistance offered to a galvanic current by the body during sleep is markedly increased. The author measured the resistance offered to the passage of an imperceptible constant galvanic current from one hand to the other, devising special electrodes for the purpose. He was able to show that the resistance is localised almost entirely in the skin, and that there is a vast difference between conduction on the palms and on the backs of the hands. By means of subcutaneous injections of atropin the resistance to a current passing from palm to palm is enormously increased, whereas the back-back resistance is unaffected. Similarly, by sectioning the sciatic and anterior crural nerves in monkeys he was able to increase the palm-palm resistance in a marked degree, without any change whatever in that between back and back. The former is evidently dependent upon and regulated by nervous impulses, while that of the dorsal surface is not so dependent.

In the sleep experiments the author proved that the palm-palm resistance increases from say 70,000 to 1,000,000 ohms, or more, while the back-back resistance sometimes increases, sometimes decreases. The former follows closely the depth or intensity of sleep, and awakening is succeeded instantly by a drop of the resistance from any level, however high, to the waking level. In the case of sleeping monkeys identical results were obtained, and thus it is possible to state accurately, without seeing the animal at all, whether it is awake, drowsy, or deeply asleep, simply on the basis of the resistance readings.

The advantage of this method is that its successful use does not require the interruption of sleep. It has shown that individuals with an increase in back-back resistance during the night were able to relax in sleep and were

refreshed in the morning; those without such increase were in reality tense and unrelaxed during their sleep. This line of evidence goes to prove that sleep is by no means always a period of quiescence and recuperation. Further, the author has been able to measure the resistance of a number of patients in catatonic stupors; though outwardly their appearance closely resembled that of sleep the resistance records were very different; the palm-palm resistance remained on a flat, low level, varying from 8,000 to 13,000 ohms. This is much below the average palm-palm resistance of normal subjects during the waking state (45,000 ohms). The conclusion is that in these patients the condition of the resistance in reality indicates an increased nervous activity. At the same time they exhibit an unusually high back-back resistance, which is in keeping with the sleep experiments, where a high back-back resistance was also found to be associated with freedom from muscular strain and a generally relaxed condition. In these cases, therefore, we have evidence for heightened nervous activity and diminished muscular activity. There must be some block between nervous system and muscular system, and this is in accordance with clinical observation, for such patients are in contact with what is going on and are often able, on coming out of their stupor, to recount in detail, with considerable accuracy, what has been going on around them.

J. S. P.

[77] **The experimental basis for chordotomy** (Experimentelle Grundlagen zur Chordotomie).—E. A. Spiegel. *Deut. Zeits. f. Nervenheilk.*, 1926, lxxxix, 18.

Section of the cord has been utilised as a last resort in cases of intractable somatic and visceral pain, as well as for certain cases of incurable spasticity in which posterior root section has proved unavailing. In the hope of ascertaining with some degree of physiological accuracy the precise columns or paths conveying (1) proprioceptive impulses to higher prespinal centres for the maintenance of tone, and (2) visceral impulses of a painful kind to higher levels, the author experimented on cats and dogs.

By the method of exclusion he was able to show that the part played by the posterior column and by the spinocerebellar tracts in the maintenance of tone is negligible, and that the path followed by the impulses underlying tone is to be found in the anterolateral region of the cord. In this area, further, are the tracts conveying painful visceral impulses. The anterolateral column, therefore, is responsible for much more than merely painful and thermal sensibility; it conveys vessel and visceral sensibility, as well as unconscious impulses of a proprioceptive character underlying tone-maintenance. It is the phylogenetically oldest part of the whole centripetal system.

The bearing of these conclusions on the practice of chordotomy is obvious.

S. A. K. W.

[78] **Theory of the mechanism for the Babinski toe phenomenon.**—A. M. Rabiner and M. Keschner. *Arch. of Neurol. and Psychiat.*, 1926, xvi, 313.

It is well established that the corticospinal system has developed at the expense of the extrapyramidal system, so that with the evolution and progressive increase in the development of the cerebral hemispheres some of the function of the extrapyramidal system, especially the striatum, is delegated to the pyramidal system, or, as Tilney and Riley say, "the striatum has become subordinate in action to the dominant neopallium."

Since dorsiflexion of the big toe is the posture in animals whose extrapyramidal system is the predominant efferent pathway, and since with the development of the pyramidal system the foot becomes plantigrade with the big toe as a fulcrum for the erect posture, we may further assume that these two pathways are the influences in maintaining, among other things, the posture for the big toe in man. Normally, with the fine balancing of these two systems, the big toe is neither in flexion nor in extension, so that with the falling out of pyramidal influences the extrapyramidal influences come into play, with a reversion to the old posture; i.e., dorsiflexion of the big toe. In other words, although dorsiflexion of the big toe is indicative of disturbance of pyramidal influences, it is also evidence of a preponderance of extrapyramidal influences. On stimulating the sole of the foot, however, we find, normally, plantar flexion of the big toe; this is due to a preponderance of the influences of the more recently developed pyramidal system.

The authors believe that this theory of the mechanism of the Babinski phenomenon finds substantiation in a number of well-established clinical facts. In new-born infants, dorsiflexion of the big toe occurs normally on stimulation of the sole of the foot. Here, with the incomplete myelisation of the pyramidal tracts, and the infant's inability to maintain completely the erect posture, this toe reaction simply represents a reversion to "early" posture, due, they believe, to a preponderating influence of the extrapyramidal system. Dorsiflexion of the big toe in pure pyramidal tract lesions giving rise to hemiplegia depends on the preponderance of extrapyramidal over pyramidal influences; i.e., with the falling out of the latter, the former, unopposed in their effect, come into play. In cases with slight involvement of the pyramidal tracts, plantar stimulation is followed by neither dorsiflexion nor plantar flexion of the big toe. Here the usual preponderance of the pyramidal over the extrapyramidal influences being reduced, an actual balancing between the two occurs so that the toe remains in normal posture. The finding of such a response (actually neither plantar nor dorsal flexion) is just as pathological as dorsiflexion. Finally, the same mechanism is applicable in explanation of the big toe phenomenon in lesions of the pyramidal tracts in the spinal cord. In complete transverse lesions of the cord, however, the appearance of dorsiflexion of the big toe in plantar stimulation has been observed at times. Since

the presence of postural reflexes in such cases depends on their severity and extent, when dorsiflexion of the big toe does occur, it may be assumed to indicate an incomplete division of the cord, with retention of the older extrapyramidal at the expense of the more recent, and consequently more vulnerable, pyramidal influences. R. M. S.

[79] **The development of the meninges.**—S. C. HARVEY and H. S. BURR, *Arch. of Neurol. and Psychiat.*, 1926, xv, 545.

AN experimental study of the origin of the meninges carried out on embryos of *Amblystoma punctatum* showed that the view of His and Kölliker that the pachymeninx and the leptomeninx have a common origin in a primitive mesenchyme derived from a specific germ layer, the mesoderm, is incorrect. Certain ectodermal elements derived in large part from the neural crest are contributed to the mesenchyme, and take part in the formation of the leptomeninx. Such origin suggests that the cells of the leptomeninx may have certain characteristics of their own, apparent in their reaction to injury and in the neoplasms arising from them.

R. M. S.

NEUROPATHOLOGY.

[80] **The significance of Hortega's work on neuroglia for the histopathology of the central nervous system** (De beteekenis van Rio del Hortega's neuroglia-onderzoek voor de histopathologie van het centrale Zenuwstelsel).—E. WINKLER, Jr. *Psychiat. en Neurol. Blad.*, 1926, March-June, 91.

THIS is a well illustrated article, in which the following conclusions are set down :

1. It is definitely established that the mesoglia cell is a true phagocyte.

2. The large group of oligodendroglia cells requires further differentiation. Some of them, regarded as satellite cells round the parenchymatous nerve cell and probably living in symbiosis with it, can under pathological circumstances take on the function of neuronophagia.

3. Alzheimer's view that the function of the macroglia has to do with metabolism in the central nervous system is upset by Hortega's researches. Weigert's opinion that it takes the place of destroyed neural tissue by fibre overgrowth is not shown to be wrong, but it is more correct to say that macroglia cell and fibre hypertrophy starts at the commencement of the general pathological process. Golgi's conception of the macroglia as having a nutritional function, and Held's lymphatic theory are alike unproven ; the hypothesis of Nageotte and of Cajal is more probable, that the macroglia has a secretory function, which perhaps shows itself mainly under pathological conditions but is then subsequently checked, so that the granuloplasm undergoes a lipoid degeneration.

S. A. K. W.

[81] **Experimental and anatomical researches on athetosis** (Experimentelle und anatomische Untersuchungen zur Lehre von der Athetose).—M. MINKOWSKI. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1926, cii, 50.

PART at least of the interest of this paper resides in the fact that the author is clearly dissatisfied with the common ill-considered views still held in many quarters, that athetosis is the result solely of disease of the corpus striatum. He cites with appreciation the results of the researches of von Monakow, Mayendorf, Wilson and others, which show the impossibility of the usually received theories.

He has experimented on cats, extirpating the anterior and posterior sigmoid gyri, and has obtained, in three instances out of four, involuntary movements which he thinks resemble those of athetosis as seen in the human subject. In these experiments the corpus striatum was left entirely intact.

A long discussion of the whole question terminates in the conclusion that athetosis and chorea are movements which should not be assigned to specific local lesions of certain paths or structures, or attributed either to excitation or inhibition of centrifugal or centripetal regulation; rather they correspond to "a combination of disorders of functional equilibrium and dynamic, to which different factors contribute, those of central nervous origin as well as of an endocrinological and humoral character."

The neurologist will at once be impressed with the excessive vagueness of this conclusion, as contrasted with the peculiarly definite character of athetosis, clinically considered, and will feel that the pendulum has swung with a vengeance to the opposite extreme. Nevertheless it is gratifying that some at least of continental observers have found the striatal theory to be untenable. S. A. K. W.

[82] **Research on mucous degeneration in the brain** (Récherches sur la dégénérescence muqueuse dans le cerveau).—D'HOLLANDER, RUBBENS and VAN BOGAERT. *Jour. de neurol. et de psychiat.*, 1925, x, 647.

THE authors, by various methods of staining, found plaques of mucous degeneration in the brains of three subjects aged over 60 years, exhibiting symptoms of mental confusion.

These plaques were present either in the white substance or in the deeper layers of the cortex of the brain substance. They were irregular in size and shape and were traversed in places by fibres; they were always in the region of a blood vessel. The size and number of the plaques varied in the three cases but had no relation to the clinical picture; moreover, they were not in any way limited to any special part of the brain.

The authors conclude by stating that the staining reactions suggest the material to be of the nature of a muco-lipoid, arising as the result of vascular degeneration or of toxins carried by the blood. They further state that they believe the degeneration, called "mucocytaire," is not a process limited to certain neuroglial cells. E. A. C.

[83] **The nature and pathogenesis of disseminated sclerosis** (Een en ander over het wezen en het ontstaan der multiple sclerose).—G. C. Bolten. *Psychiat. en Neurol. Blad.*, 1926, Jan.-Feb., 57.

This is an interesting essay on the essential problem of disseminated sclerosis, in which the author discusses and dismisses all toxi-infective theories of the disease, and ranges himself with those (Müller, Strümpell, Marburg and others) who consider it arises on the basis of faulty development of the central nervous system, as revealed by decay of nerve-fibres and axis-cylinders, a substitutive neurogliosis taking the place of the dying parenchyma.

S. A. K. W.

[84] **The pathogenesis of epidemic encephalitis and of chronic postencephalitic syndromes** (Contribute allo studio della patogenesi della encefalite epidemica e delle sindromi croniche postencefalitiche).—V. M. Buscaino. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 116.

A full description of the author's researches, which show that besides the evidence of chronic hepatic lesions there existed in a subject who was neither alcoholic nor tubercular clear signs both in the small and large intestine of lesions of the mucous membrane. These consisted of hæmorrhagic congestion, catarrh, specially of the small intestine, atrophy of the walls and lesions of the villi in the small bowel, and necrosis, cystic degeneration of glands and submucous infiltration in the large bowel. The preaortic glands, which receive most of the lymph from the intestines, showed signs of recent and chronic adenitis.

These lesions indicate the passage of toxins (amino-groups), capable of producing the postencephalitic syndromes, into the circulation. These toxins may produce both hepatic and cerebral lesions.

R. G. G.

[85] **A contribution to the study of neuritis** (Contribute alla conoscenza del processo nevritico).—G. B. Belloni. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 105.

The pathological results of exposing nerve trunks to cold were observed. According to the degree of cold applied the lesions of necrosis, interstitial neuritis and parenchymatous neuritis developed, thus indicating that these conditions are phases of the same process, and may be combined as a mixed type of neuritis when the noxious influence is not sufficiently severe to cause a complete interstitial neuritis. On the other hand Wallerian degeneration should be kept clearly distinct from neuritis.

R. G. Gordon.

SENSORIMOTOR NEUROLOGY.

[86] **A case of chorea with cirrhosis of the liver** (Ueber einen Fall von Chorea mit Lebercirrhose).—GEORG SCHALTENBRAND. *Deut. Zeits. f. Nervenheilk.*, 1926, xci, 174.

THE patient was an elderly woman of 59, who had suffered for a number of years from jaundice of a more or less chronic kind; some years after its onset she began to develop nervous symptoms—a series of apoplectiform attacks, paresis of one arm, loss of speech, and some unconsciousness characterising these attacks. Involuntary movements also developed with them, and eventually became practically constant and choreiform in type. Enlargement and hypofunction of the liver were clearly diagnosed by various clinical tests, and the spleen also was discovered to be hypertrophied.

At the autopsy the liver was found to be cirrhotic. A complete examination of the central nervous system was made, the following being the chief points of interest: (1) widespread fibre-degeneration with the development of "holes" or "gaps" in the nervous tissues as a sequel. These defects were especially noticeable in the fibre-systems of neostriatum, palæostriatum and mesencephalon; (2) pronounced degeneration of ganglion cells; (3) overgrowth of glia cells, and the presence of many compound granular corpuscles; (4) overgrowth of capillaries. The cortex, especially the frontal cortex, and the nucleus dentatus showed these changes, in addition to the areas already mentioned.

The author inclines to consider his case as an atypical example of hepatolenticular degeneration. It should be remarked that no corneal ring of pigmentation was found. As far as the reviewer has noticed, there is no reference to a Wassermann examination in serum or spinal fluid, although the patient had had three miscarriages.

S. A. K. W.

[87] **Spasmodic torticollis and chronic hepatitis following poisoning by war gasses** (Torticollis spasmodique et hépatite chronique, suite d'intoxication par les gaz de combat).—VAN BOGAERT. *Jour. de neurol. et de psychiat.*, 1926, xxv, 92.

VAN BOGAERT showed at the Belgian Society of Neurology a case which is of importance in relation to the borderland of Wilson's disease. The patient was a young man of 32, suffering from torticollis, with slight athetotic movements of the left hand and slight spasms of the muscles of the trunk and left hip and thigh. The spasms began as cramp-like sensations in the neck four or five weeks after gas poisoning in 1918, and at that time, with the bronchitis and conjunctivitis due to the gas, the patient had jaundice.

The jaundice disappeared in the course of two or three months, but the patient began to suffer from periods of dyspepsia occurring at intervals and lasting ten days or so. When he was examined at a hospital in February

1924 it was found that his liver extended two finger-breadths below the costal margin and was hard and tender. In February 1925 a similar enlargement was found, but three days later the liver had become normal in size; later it enlarged again and bile pigments were found in the urine.

One of the patient's sisters died of cirrhosis (presumably hepatic). Van Bogaert was inclined to place this case in a position intermediate between torticollis and torsion spasm. In an addendum he relates that an emerald green circle has been observed at the irido-corneal angle and, though some doubt remains whether it is on the iris or cornea, he is impressed by the resemblance to the ring of some cases of the hepato-lenticular group.

J. P. MARTIN.

[88] **A case of chronic poliomyelitis showing a transition towards amyotrophic lateral sclerosis** (A propos d'un cas de poliomyélite antérieure chronique faisant transition entre cette dernière et la sclérose latérale amyotrophique).—FOIX and CHAVANY. *Jour. de neurol. et de psychiat.*, 1926, XXV, 67.

THE case reported here was clinically one of slowly progressive wasting of the muscles of the upper limbs and neck, showing in the later stages increased knee-jerks and extensor plantar responses. There were no clinical signs of syphilis, but the Wassermann reactions do not seem to have been tested.

Pathologically, in addition to disappearance of the anterior horn cells in the cervical and dorsal portions of the cord, there was definite degeneration in both pyramidal tracts in the lumbosacral enlargement. The authors note, also, and the illustrations show, degeneration of the margin of the cord at various levels, and there was some meningeal thickening in the dorsal region. From these circumstances and from the clinical characters it seems possible that the case was a syphilitic one.

This report and its title indicate the lack of clinical and pathological names applicable to cases with muscular atrophy, and the difficulty of avoiding the mingling of clinical and pathological terms. The view in this country, we believe, is that most cases of progressive muscular atrophy show *post-mortem* some changes in the lateral columns; signs of spasticity may or may not appear during life, but if they do appear we should not for that reason give the disease a different name.

J. P. MARTIN.

[89] **Seven cases of a peculiar family disease** (Sept cas d'une maladie familiale particulière: troubles de la marche, pieds bots et aréfléxie tendineuse généralisée, avec, accessoirement, légère maladresse des mains).—GUSTAVE ROUSSY and GABRIELLE LEVY. *Rev. neurol.*, 1926, xlii, 427.

THE main features of these cases are the development, as a rule in childhood, of bilateral claw foot with occasional slight wasting of the small muscles of the

hands. In all cases there was complete absence of the tendon jerks. The cutaneous reflexes were variable, the abdominals in some cases present, in some absent, the plantar responses sometimes doubtful, never extensor. Slight nystagmoid jerkings were present in one case. Sphincter control was regarded as imperfect in three cases, but these were all children and the trouble seems to have been confined to bed-wetting. The authors conclude that the disease which they have described is distinct from Friedreich's disease, giving as their reasons the absence of any definite signs of cerebellar or pyramidal affection. They admit a superficial resemblance to the peroneal type of muscular atrophy, but dismiss the possibility of their cases belonging to this group.

C. P. S.

[90] **Extensor rigidity following a penetrating wound of both hemispheres.** —C. C. COLEMAN. *South. Med. Jour.*, 1924, xvii, 865.

THE patient was a man of 31, who attempted suicide by shooting himself in the head. The bullet entered the cranium just above the right temporal ridge and behind the right coronal suture. It passed transversely across the hemispheres, ranging slightly downward and backward, lying finally in close proximity to the left parietal bone, about one inch below and behind the point corresponding to the wound of entrance. When seen twelve hours later he lay in rigid extension with the head somewhat retracted and the arms pronated and extended.

An operation was performed, at which the right lateral ventricle was found to be filled with bloodstained fluid, but owing to the patient's precarious state no attempt was made to remove the bullet. Seven days later the unconsciousness still continued, the decerebrate attitude being maintained, with slight head retraction, the teeth were clenched, the legs in spastic extension and the feet in plantar flexion, the arms generally rigid in extension, but the flexor position was being assumed at times, with pronation of the forearms. On the eighth day the patient had a tonic extensor fit which was suddenly initiated by retraction of the head and an exaggeration of the decerebrate position. The respirations were embarrassed and laboured.

Three weeks later there were a few signs of returning consciousness. Magnus and de Kleijn tonic neck reflexes were obtained. Fifty-two days after the injury the patient was able to make a peculiar rhythmic inarticulate cry and to move the right fingers and right leg slightly. Six months after the injury he began to improve more rapidly; a year after his condition was one in which residual weakness was found only in the left upper extremity.

In all, the attitude of extension with rigidity was maintained for more than one hundred and twenty days.

J. S. P.

[91] **A biological and morphogenetic study of microcephalia vera** (Biologisches und Morphogenetisches über die Mikrocephalia vera).—C. v. MONAKOW. *Schweiz. Arch. f. Neurol. u. Psychiat.*, 1926, xviii, 3.

THIS is a long and minute study of a case of microcephaly ; the infant, a male, lived for four months. The weight of the brain was only 25 gm. An elaborate examination of the whole brain was made by the method of serial section. The results are compared with those obtained by investigation of some 13 other cases of microcephaly which the author and his pupils have at one time or another studied.

It is impracticable even to summarise the numerous data of great interest obtained by this fine piece of research ; only one or two can be alluded to.

(1) In spite of the absolute dwarfing of the cerebral cortex (total amount, eight cubic centimetres) both the pyramidal tracts and the fillet were extremely well myelinated, even overdeveloped ; the major part of this miniature cortex consisted of rolandic region (especially the precentral gyrus). The occipital cortex, corpus callosum, frontal lobes, cerebellar hemispheres and grey matter of the pons were all awanting.

(2) Thalamus, corpus striatum and connections, regio subthalamica, nuclei of cranial nerves, and cord were all more nearly normal. (A long list is provided of the actual anatomical findings).

(3) Clinically, the infant neither laughed nor smiled, and there was little evidence of the existence of an emotional side to its activities. It seemed, when tested with various substances in the mouth, to exhibit the rudiments of a correct affective response (sweet, bitter).

(4) The infant was practically without cerebrum and cerebellum, but the phylogenetically old brainstem and cord were relatively normal. In this ' preparation ' some instinctive reactions were present and more or less of normal character. While no locomotor or grasping reactions were found, there were general, combined, movements of defence of the whole body.

S. A. K. W.

[92] **Examination of the pupil** (L'exploration de la pupille).—RAINS and COPPEZ. *Jour. de neurol. et de psychiat.*, 1925, xii, 753.

A CONCISE article on the pupillary reactions of the eye in the normal and pathological states. The authors briefly refer to experimental lesions of the various nerves to the eye and the resulting change in reflex activity. They then pass on to the discussion of the action of various drugs. In the third part of their work various pathological conditions of the pupil and its reflexes are mentioned ; and under each section they discuss the possible pathological basis for such changes.

They are to be congratulated on the conciseness of their work. A few references to monographs on the various conditions mentioned in their paper would have enhanced its value.

E. A. C.

[93] **The pupils in somatic and visceral disorders in association with referred pain and hyperalgesia.**—J. BYRNE. *Jour. Nerv. Ment. Dis.*, 1926, lxiii, 105.

THE author lays stress on observations of pupil reactions in association with areas of superficial and deep hyperalgesia in painful visceral lesions. He uses the term " pseudo-paradoxical reaction " when one pupil is smaller than the other after a painful lesion while the animal is absolutely quiet, but becomes larger directly the animal is disturbed, excited or hurt. If the viscus involved in the lesion originally obtained its nerve supply from above the tenth thoracic segment the pupil showing the reaction will be homolateral, but if below this segment the reaction will be contralateral.

His conclusions are that the pseudo-paradoxical pupil phenomenon is a reliable physical sign of somatic lesions associated with pain and tenderness. Taken in conjunction with referred (reflected) pain and the associated areas of referred (reflected) hyperalgesia, superficial and deep, it is a reliable corroborative localizing sign of visceral disease. It is a reliable objective sign of pain useful in the detection of malingerers and in the protection of honest victims of negligence injuries.

In the mechanism and significance of reflected pain, areas of deep hyperalgesia have as much or even more significance than areas of superficial hyperalgesia. In practice the exact boundaries and names (numbers) of the areas of superficial hyperalgesia as they occur upon the trunk are of little importance, the main thing being to be able to detect an area which has been shown to be closely related to one or other of the viscera. On the trunk the complete areas of superficial hyperalgesia correspond so closely with the areas of root distribution of the thoracic and lumbar nerves that in practice the two sets of areas may be regarded as more or less coextensive, keeping in mind that the reflected areas of necessity must occur within one or more of the root areas.

In the light of the present studies the areas of reflected pain and hyperalgesia described by Head require revision and amendment.

The Dejerine or Klumpke-Dejerine sign in injuries of the spine about the level of the thoracic-cervical junction needs revaluation. The study of the pupils in association with referred and reflected pain and hyperalgesia should be made an integral part of all routine physical examinations.

R. G. G.

[94] **Herpes zoster and chickenpox** (Herpes zoster en varicellen).—W. M. v. d. SCHEER. *Psychiat. en Neurol. Blad.*, 1926, March-June, 117.

A CHILD of nine years, who had had a severe attack of chickenpox at the age of two, developed herpes zoster (left leg). Before the diagnosis was definitely made and while the boy was not obviously ill he was allowed to go to a children's party. Seventeen days later two of the children who were at that party developed chickenpox, and also a third, a little girl of the same family, who

had in the interim not come in contact with any other children at all. In each instance a pronounced stomatitis aphthosa was remarked. At the same time, an outbreak of herpes labialis with angina herpetica occurred in an institution in the same locality. The author dismisses the possibility of all these clinical phenomena being of the nature of a coincidence and considers they were etiologically connected.

S. A. K. W.

[95] **A case of unusual brachial plexus palsy.**—P. Lewin and H. Arkin. *Arch. of Neurol. and Psychiat.*, 1926, xvi, 75.

The authors report a case of bilateral seventh cervical root palsy due to birth trauma. The case was one of face presentation, forceps and strong traction being required to effect delivery. The injury was evidently in the roots of the plexus close to their points of exit from the spinal column, and possibly within the spinal canal.

R. M. S.

[96] **The pathogenesis and treatment of traumatic neuritis of the ulnar nerve in the post-condylar groove.**—Harry Platt. *Brit. Jour. of Surg.*, 1926, xiii, 409.

(1) This paper is based on the observation of twelve cases of lesion of the ulnar nerve among some 330 cases of fracture of the humerus and of other traumata (dislocation at the elbow joint, etc.). The nerve lesion is usually a primary contusion and rapid spontaneous recovery tends to occur. Rarely, a friction or tension 'neuritis' ensues, in which case the nerve-trunk should be explored and displaced to a new bed in front of the internal condyle.

(2) In addition, six cases are detailed of late ulnar nerve involvement after fractures. This is a remote sequela of certain fractures of the external condyle sustained in early childhood. The latent period is rarely less than ten years. The neuritis is a friction or tension lesion, predetermined by the existence of a gross cubitus valgus deformity, the nerve-trunk being compelled to take a longer course and becoming stretched like a bow-string in the shallow post-condylar groove. Operative treatment is indicated in all cases, viz., anterior transposition of the nerve, and supracondylar osteotomy.

(3) Finally, six cases of recurring dislocation of the ulnar nerve are recorded. Of the predisposing causes of hypermobility or luxation little is known. The neuritis, when it develops, is a typical friction lesion, with the ultimate formation of a fusiform neuroma. For this group also operative treatment is indicated.

J. S. P.

PROGNOSIS AND TREATMENT.

[97] **The prognostic significance of a primarily negative spinal fluid in syphilis** (Ueber die prognostische Bedeutung primarnegativen Liquors bei Syphilis).—Robert Schmidt. *Deut. Zeits. f. Nervenheilk.*, 1926, xci, 128.

By definition, a case of genuine syphilis is stated to have a primarily negative spinal fluid if the finding is negative at the first examination, either when the patient has had no treatment at all, or has had none of an antispecific character for not less than five years prior to the examination.

The number of cases investigated by the author was 155, all of which came under this category: they either had had no treatment, or none for five years, and their fluid was negative. Of these, 71 (16 per cent.) showed no nervous symptoms of any kind: 57 (37 per cent.) gave clinical evidence of cerebrospinal syphilis: and 27 (17 per cent.) of tabes dorsalis. (It should be stated that in all cases all the usual tests of the spinal fluid were conducted.)

None of the 71 cases of the first group has subsequently developed nervous symptoms, nor has in any case the fluid become positive. None of the 57 cases with cerebrospinal syphilis has since shown any sign of progression of the disease.

With one exception (and that probably a case of hereditary tabes) none of the 27 cases of the third group has since shown increase of tabetic symptoms: they have remained mono- or oligosymptomatic. The author reaches the important conclusion that primarily negative fluid cases (as defined) must be considered extraordinarily favourable as far as prognosis is concerned.

S. A. K. W.

[98] **The treatment of trigeminal neuralgia by X-rays** (Ueber Röntgenbehandlung der Trigeminusneuralgie).—Walter and Lax. *Münch. med. Woch.*, 1926, lxxv, 644.

Professor Walter and Dr. Lax report very good results from the treatment of trigeminal neuralgia by X-rays. Since 1920 they have treated thirty cases and have had nineteen cures (63 per cent.); in addition, six cases showed great improvement, *i.e.*, the patients remained free from attacks of neuralgia but were conscious of a hypersensitiveness of the affected side of the face when eating or when exposed to wind: only one patient failed to derive benefit from the treatment. In one of the cured cases recurrence took place after two years and cure again followed application of the rays. The authors tried to direct the radiation on to the Gasserian ganglion of the affected side through the temple, and sometimes, in subsequent exposures, through the temple of the opposite side. The tubes used were mostly hard, the exposures 5–10 minutes and the dose on the average "128 *skl. Belastung* $\frac{1}{3}$ *der H.E.D., eine Filtierung von* $0.5Z+1Al$" at 24 cm. distance. The number of exposures

in many cases was only one, and, except in one unsuccessful case, was never more than five. Exposure was usually followed by an exacerbation of the disease and it was soon observed that such exacerbations had a very favourable indication.

It is possible that much depends on the technique employed, for two of their patients failed to derive benefit when treated at other institutions.

J. P. M.

[99] **The treatment of tabes and general paralysis with tryparsamide** (De Tryparsamide-behandeling bij tabes en dementia paralytica).—Van Wulfften Palthe. *Neurotherapie*, 1925, v, 95.

The author treated eight cases of general paralysis, two of tabes, and four of taboparesis, with tryparsamide in the course of one year. Tables are given with full details of the cases. Of the total of 14 neurosyphilitic cases, two were much improved or exhibited complete remission of symptoms; six improved; three were unchanged; two became worse, while one patient died. One of the two greatly improved cases was that of a general paralytic, the other that of a taboparetic; the patient who died was a general paralytic, death ensuing four days after the first injection.

These results are compared with those of Dawson and of Lorenz, and with a number of reports on the treatment of general paralysis with malaria, the conclusion being that tryparsamide is not to be depreciated in comparison with malarial methods and is well worth further trial.

S. A. K. W.

[100] **A comparative study of various methods of the administration of luminal in epilepsy.**—H. A. Patterson, Le Grand A. Damon, and P. Levi. *Jour. Nerv. Ment. Dis.*, 1926, lxiii, 446.

The authors find that luminal may be given orally, intravenously or intraspinously. No ill effects have followed the administration of therapeutic doses of this drug by any of these methods. No tolerance is developed for phenolbarbital by any of the forms of treatment used. The effect of luminal in epilepsy is palliative rather than curative.

Sudden withdrawal of the drug is contraindicated. Luminal treatment by any of the four methods mentioned apparently has more influence upon severe than on mild attacks. The period required for the appearance of therapeutic effects is as follows: orally, 1–2 hours; subcutaneously, 15–30 minutes; intravenously, almost immediately; intraspinously, half-an-hour or more.

The subcutaneous method of administration is preferable in serial seizures. The employment of the intravenous method is indicated in status epilepticus. Intraspinous injection may subsequently render refractory cases more amenable to other types of treatment.

R. G. G.

Psychopathology.

PSYCHOLOGY.

[101] **The significance of the snake in dreams.**—URSULA H. MCCONNEL. *Psyche*, 1926, xxiii, 12.

MISS MCCONNEL discusses the difference between social symbolism and dream symbolism and states that failure to distinguish these two forms has led to controversy between anthropologists and psychoanalysts. The author's aim is to expose what she supposes to be the fallacy latent in the psychoanalyst's interpretation of typical dream symbols. Criticising the psychoanalytical interpretation of snake symbolism which she thinks is repressed sexual desire, and of water as a symbol of rebirth, she states that it is not surprising to find the psychoanalytical interpretation of snake symbolism, owing to the causal relationship existing between the snake as a symbol of sin in religious tradition, and in the dream as repressed sexual desire. She thinks that it occurs in dreams primarily as a symbol of sin and secondarily as a sex symbol. She believes that the beneficent aspect of the snake found in certain primitive races is the exact opposite to the destructive attitude of European traditions. The significance of the snake in each dream respectively corresponds to its social significance in each community. In the European community it symbolises the impulse against which social authority is waging war, but in the New Guinea native's dream the snake is identified with the repressing agency in the form of a beneficent being; it cannot therefore in this case be a phallic symbol. The author thinks that this comparison proves that Freud's dictum "Everywhere we find the same symbolism and in every case understand without further information," is too hasty a generalisation. She thinks that he ignores anthropological data.

ROBERT M. RIGGALL.

[102] **Snake symbolism in dreams** (a Rejoinder).—ERNEST JONES. *Psyche*, 1926, xxiv, 87.

MISS MCCONNEL has failed to grasp the distinction between the two different mental processes which the term symbolism denotes in psychoanalysis. Ernest Jones accepts for present purposes the expression "social symbolism" but points out that her term "dream symbolism" is too specific and substitutes "unconscious symbolism" which will include the symbolism of neurotic phantasies, jokes, etc. Miss McConnel's suggestion that dream symbols owe their meaning to cultural sources is valid only in so far as these are social symbols and does not apply to unconscious symbolism as understood by psychoanalysis. She thinks that the conscious thoughts attached to the snake idea are enough to account for the symbolism and overlooks the further accretions added to this idea from the unconscious. Pointing out that unconscious ideas are concrete and particular, and that the formation of general

and abstract concepts savours more of conscious mental systems, he states that Miss McConnel is mistaken in her view that the psychoanalytical interpretation of snake symbolism is 'repressed sexual desire.' When the snake occurs in a dream as an unconscious symbol it generally represents the paternal phallus. The New Guinea native's dream of the snake symbolising "a beneficent being" does not, therefore, surprise the psychoanalyst. It is further pointed out that Miss McConnel is mistaken in attributing to Ernest Jones certain ideas associated with what she calls a "conviction of sin complex."

ROBERT M. RIGGALL.

NEUROSES AND PSYCHONEUROSES.

[103] **The revision of the problem of the neuroses** (Die Revision der Neurosenfrage).—OSWALD BUMKE. *Münch. med. Woch.*, 1925, 1815.

THE author first deals at length with the history of the term neurosis and its changes in meaning; at first used by Cullen, it meant in Romberg's time any sort of nervous disorder, organic or functional; since Virchow it has gradually narrowed down to those nervous disorders for which no anatomical basis is known, and many of these, such as the Parkinson syndrome and chorea, have only recently been removed from its sphere. The question remains, are there any real psychoneuroses, or will further pathological study find a basis for them all? Attempts at purely physical explanations are unsatisfactory, and mental factors have to be taken into consideration, even if only in their relation to altered bodily functioning. Oppenheim's views date from a time when brain and mind were held to be identical. The psychological structure of the neuroses seemed to have been made certain by Charcot's studies in hysteria, when Beard brought forward the syndrome neurasthenia, in which subjective symptoms were combined with objective somatic disorders, responsibility for which could be disclaimed by the patient, so that neurasthenics thought themselves and were counted 'the salt of the earth.' The view that this syndrome of oversensitive and fatigable nerves was due to modern conditions and stress of life led to an inclusion within it of all sorts of conditions, notably mild degrees of schizophrenia and manic-depressive states, and to a turning of attention away from constitutional and hereditary factors, and from the study of mental processes and the development of character and personality.

The pendulum has now swung back, and psychopathology has full sway, but the underlying somatic factors have only recently come into their own with the study of constitution; and here there is too much vague talk of endocrines, with little clearer understanding of facts than in the humoral pathology of Hippocrates. We must study mind and body together and their interaction but keep clearly in view what sort of disorders of function we may expect to find. It is doubtful whether we shall ever find a pathological anatomy for the neuroses in the sense that we find it for general paralysis—there is obviously no gross disorder of the brain, such as syphilis, tumour, or softening; the changes are not such as these, as if a child pulled a clock to pieces, but rather

such as result from our altering the length of the pendulum. Chemical or dynamic changes there undoubtedly are, differing probably in quantity rather than quality from the normal, but that does not remove the utility of investigating the mental concomitants, any more than does the study of colour become meaningless because we correlate colours with various wave lengths of light. When we understand fully the physiological processes connected with excitement, exhaustion, fear, obsessive thinking and the like, we may have a fuller understanding of the neuroses, but for the meantime we must deal with them on their own ground, that of the mind. Let us not talk glibly of endocrine disorders and metabolic changes until physiological chemistry has set these studies on a firmer footing. Yet study of constitutional types and their inheritance and their relation to mental tendencies is producing valuable material and we may in time be able to correlate these facts with the incidence of the neuroses.

The chief result of importance arising out of this necessity for regarding the neuroses from the mental point of view, is that the borderline between neurosis and psychosis has become obliterated, and that we must investigate and treat the dispositions underlying hysteria, paranoia, and manic-depressive insanity on the same lines, regardless of the certifiability or not of the acute state; in all this realm of mental disorders of a functional kind we must abandon the idea of finding concrete disease pictures permanently and as a matter of principle, and, unlike organic disease, realise that here there is every gradation between the normal and the pathological. Other sciences, like botany and zoology, have to be content with selecting individual types out of an infinite series of manifold variations; types, whether of plants or of temperaments, must of necessity be a sort of abstraction, an arithmetic mean of the variants, useful for classification and orientation, but we must not try to fit all cases into rigid categories. In place of disease-unity we now speak of syndromes, and analyse their structure into inherited and acquired causes, disposition and mental and physical factors; but this analysis has become more difficult with increased knowledge; heredity was once thought a simple passing on of simple entities, whereas its complications are now seen to be infinite. In the same way the evaluation of acquired factors has become more complex, and their separation from innate dispositions, physical disorders may have mental accretions added, morbid concentration on physical manifestations, Kretschmer's volitional reinforcement of reflexes, and so on. Even the actual process involved between thought and action in an ordinary volitional movement is obscure, still more their alterations in hysteria, for instance. We need not merely to diagnose a hysterical paralysis, nervous tachycardia, or innate disposition to abnormal reactions, but to know exactly why in any given case this particular set of conditions came about. Bumke believes that no one school has all the truth, yet all may have a little of it—though the psychoanalysts least of all, for he objects to the idea of the unconscious and accepts as unconscious only physiological processes.

Summarising, he says: there are no longer any psychoneuroses; they have become absorbed into nervous reactions and constitutions, psychopathies and functional psychoses; the term neurosis has some use, so long as we clearly realise that here, just as in the manic-depressive psychosis, there is often an inextricable mixture of physical and mental disorder. He regards the historical development as one of progress from purely somatic views to those which are preeminently psychological, and this is of practical value from the standpoint of treatment. One main advantage has come from this development, namely the rapprochement between neurology and psychiatry.

M. R. BARKAS.

[104] **Three theses on the question of the neuroses** (Drei Thesen zur Neurosenfrage).—S. LOEWENTHAL. *Münch. med. Woch.*, 1926, 99.

1. THERE exists, even if it be infrequent, a true traumatic neurosis in Oppenheim's sense, though most authors at present deny this.

2. Neurasthenia is generally speaking an inborn weakness; cerebral neurasthenia arises practically never in healthy people—contrary to general opinion—merely as the result of mental overexertion.

3. Hysteria as a mental disturbance arises through false direction of the will, with accumulation of psychophysical energy in the wrong direction. This is conditioned by the hysterical constitution, for which there are definite bodily signs.

The author compares the question of the neuroses to a Cerberus or hydra-headed monster, whose heads are always being cut off by the sword of dialectics, and always grow again, so with the traumatic neurosis, which, slain by Strümpell, grew again as a war neurosis, again to be cut off by Nonne and Gaupp, and is now recrudescent. He argues that there must be degrees between actual destruction of nerve substance and complete normality, and these intermediate stages may well be at present such as our methods of examination will not detect, yet formed by some sort of injury to the nerve cells which allows them still to function, but in an abnormal way; thus the traumatic neurosis may be considered to cover those cases where injury of an irreparable kind is done to nerve substance, but leaves them still capable of living; a similar but transient state is found in toxic and infective psychoses. The best-known instance is the Friedmann vasomotor symptomcomplex, affecting the cortex and its vessels (traumatic cerebral weakness), and logically similar conditions may affect the medulla and basal ganglia, and play a part in hysteria and hypochondria. Symptoms of such disorders may be expected to be found in the vegetative system. Oppenheim regards a lowered resistance to alcohol to be another, while lowered skin resistance to galvanism and lowered threshold to pain with faradism are others; long-lasting congestion after bending down is yet another; further methods of examination will probably reveal other symptoms. Neurasthenics the author regards as innately inferior,

often of an asthenic habit, liable to feeble connective-tissue formations and visceroptosis ; they need a world of days lasting 12 hours, six for sleep ; mental overstrain does not produce neurasthenia in normal people, unless sexual excess, sleeplessness, alcohol, etc., are superadded. Similarly, mental exertion does not affect metabolism.

Hysteria is a mental disorder, but of emotion rather than intellect, and still more one of will ; he regards most of the war hysterics as suffering from 'dysbulia,' their will being directed wholly or partly consciously into wrong paths ; he asks himself with each patient "What does he want ?" But such a misdirection of will does not lead in normal people to hysterical symptoms, or at least only under hypnosis. The other requirement is the hysterical constitution. This may be recognised by physical signs ; hysterics are never ugly, but usually have well formed features and physical make-up. They have either a rather expressionless face, or an exaggerated and staring look, but never a normal play of facial movement ; their hands are shapely but lack expression. He does not consider that they are in any way related to sympatheticotonic or vasotonic cases. Generally there is some degree of bodily infantilism or impaired development, and hereditary factors enter into their constitution.

M. R. BARKAS.

[105] **A study of the psychogenesis of confirmed stammerers.**—L. PIERCE CLARKE. *Jour. Nerv. Ment. Dis.*, 1926, lxiii, 238.

ACCORDING to the author stammering is due to the employment of the same movements in attempted speech as would ordinarily be concerned in the act of suckling in infancy. Stammerers are therefore "oral erotics" who have fixated the action of suckling as a result of some psychic trauma at this period of life. The therapeutic application of this hypothesis is not clear. A "phantasy" of a stammerer as to her emotional experiences with a wet nurse is given, but, like all such narratives, when set down in cold print it fails to convey much conviction.

R. G. G.

PSYCHOSES.

[106] **The sudorific reaction in certain types of psychosis.**—L. C. F. CHEVENS and P. B. MUMFORD. *Jour. of Ment. Sci.*, 1926, lxxii, 331.

THE physiology of sweating is briefly discussed as well as the types of sudorific reaction and the factor of sudorific delay with the influences modifying it. From a series of experiments some correlation between the factor of sudorific delay and the mental state has been demonstrated. A routine examination of 77 individuals, consisting of five controls and 72 patients in Parkside Mental Hospital, revealed a wide variation in the factor of sudorific delay. It was made clear that dementia præcox was accompanied by a marked delay in the onset of sudoriferous activity, and that mania showed some increased rapidity

of onset as compared both with the average figure for healthy persons and with those suffering from other mental diseases. It is of interest to note that there is little correspondence between the temporary mental state and the factor of sudorific delay, the chief factor being the permanent mental condition. In attempting to explain these findings certain generally accepted facts may give some clue: (1) marked alteration in the structure of the endocrine glands has been observed by some in varying types of mental disease—notably in dementia præcox; (2) the endocrine and sympathetic systems are closely allied and interdependent; (3) the secretion of sensible perspiration, according to Langley, is under control of the central nervous system through the sympathetic system. Thus a damping down of the activity of the sympathetic nervous system will result in impairment of response to heat of the sudoriferous glands. A possible explanation of the high sudorific delay given by primary dementia cases and the low sudorific delay given by mania is found in the sluggishness or increased activity of the sympathetic systems in these cases. An interesting analogy may be pointed out between the sudoriferous activity of the palms at rest and the body after exposure to heat in the postencephalitic states and dementia præcox. One would imagine a habit-formation to have some influence on sudoriferous activity, the maniac, on account of his restlessness, sweating much more frequently than the primary dement, and thus reacting more quickly when exposed to radiant heat. In the series of cases examined, however, the sudorific delay of the restless dement or the dement leading a fairly active life was found to differ very little from that of cases of katatonic stupor.

C. S. R.

[107] **Psychoses occurring during the puerperium.**—E. A. Strecker and F. G. Ebaugh. *Arch. of Neurol. and Psychiat.*, 1926, xv, 239.

The authors discuss fifty cases of psychoses associated with or following childbirth. The diagnoses were: manic-depressive, 18 cases; toxic-exhaustive, 17; dementia præcox, 13; general paralysis, 1; and psychoneurosis, 1.

The chief points of interest brought out in the clinical studies were that, although the occurrence of manic-depressive psychosis is not determined by childbirth, its clinical picture may be coloured by it, and there is greater likelihood of hypermanic states, disturbance of the sensorium, and hallucinosis. In dementia præcox there is a greater frequency of manic-depressive features than is usually noted, and, as in manic-depressive psychoses, the sensorium is likely to be clouded. Contrary to the usual belief, dementia præcox following childbirth does not deteriorate with unusual rapidity. The term "puerperal psychosis" does not represent a clinical entity and should not be used.

R. M. S.

[108] **Paranoid psychosis with uræmia.**—K. A. MENNINGER. *Jour. Nerv. Ment. Dis.*, 1924, lx, 26.

A CASE of uræmic delirium is described fully. The patient presented certain paranoid delusions and hallucinations which she remembered and related afterwards. At no other time in her life did she have any paranoid symptoms. The delusions were subjected to a psychoanalytic interpretation on the ground that they represented release phenomena due to the poisoning of higher cortical levels.

R. G. GORDON.

[109] **Dementia præcox in identical twins.**—G. H. PARKER. *Jour. Nerv. Ment. Dis.*, 1926, lxiii, 135.

TWO pairs of identical twins suffering from dementia præcox are described and six others described in the literature are referred to. A case of dementia præcox in one of a pair of identical twins has not yet been reported. This is strong evidence in favour of the contention that this disease is germinal in origin.

R. G. G.

[110] **The psychological relationship between sexuality and alcohol.**—KARL ABRAHAM. *Internat. Jour. of Psychoanalysis* 1926, vii, 1.

THIS paper, published originally in 1908, was the first psychoanalytic treatise on the subject of alcoholism, and is not otherwise accessible.

Men are more prone to alcoholic indulgence than women. Addiction to alcohol has been regarded as a token of manliness. Drinking is generally regarded as unwomanly, at least it is not the subject of boasting as it sometimes is in man. Is this difference due to a difference of sexuality? Female sexuality shows greater proneness to repression and resistance-formation. Repression of infantile activities suffers reinforcement at puberty, with resultant passive female reaction. The active male libido tends to overcome resistance.

The sex instinct is very complex, and as the primacy of the heterosexual component is attained the other component instincts are repessed and sublimated in the form of social activities. Alcohol dispels resistance and injures or destroys these sublimations. This is exemplified in the release of homosexual activities in men under the influence of alcohol, both in their behaviour to each other and in the circulation of obscene jokes (Freud has termed this mental denudation). Under the influence of alcohol flirtations assume brutal and repulsive forms. Alcohol also lets loose sadistic and masochistic tendencies. This can be seen in student drinking customs. The incest barrier is not always respected by alcohol, *e.g.* the case of Lot's daughters.

Alcohol releases sexual activity and stimulates the masculine complex. The inhibitions removed by alcohol are the products of the sublimation of sexual energy. Alcohol gives rise to a feeling of sexual capacity.

When we drink a man's health we signify the desire that the vivifying properties of the wine will benefit him. Respect for prowess in drinking is bound up with respect for sexual prowess. The man who does not drink is considered a weakling. Bragging of drinking exploits is characteristic of early manhood, and in later years alcohol is sometimes sought after on account of decreasing potency. Alcohol flatters a man's sense of manhood. Woman's appeal to man lies in her resistances. Alcohol would remove these resistances and so rob her of her charm; thus it does not appeal to her with the same force. Under observation women addicts reveal homosexual tendencies.

There is an analogy between alcoholism and sexual perversion. The pervert is fixated at a preliminary sexual goal; alcohol produces sexual excitement; to the alcoholic this becomes the end, not the means. Further, the alcoholic, like the pervert and the neurotic, wards off any attack on his symptom because it is an attack on his sexuality. The well-known jealousy of drunkards is the result of diminishing sexual potency. He uses alcohol as a source of effortless sexual gratification. The misuse of drugs seems to be explicable in the same way as alcoholism.

DAVID MATTHEW.

[111] **Blood calcium and phosphorus in personality disorders.**—G. W. HENRY and W. W. EBELING. *Arch. of Neurol. and Psychiat.*, 1926, xvi, 48.

INVESTIGATION has indicated that there is no demonstrable relation between acidosis and personality disorders, but the possibility that conditions of alkali excess or carbon dioxide deficit may have some relation to states of mental tension is suggested by observations of the development of tetany and convulsions in conditions of alkalosis. Henry and Ebeling made calcium determinations on specimens from 88 patients, eleven of whom presented no personality disorder. Phosphorus determinations were made on specimens from 68 persons, seven of whom presented no personality disorder. The calcium and phosphorus content of the blood in personality disorders was found to be within normal limits, but in manic states there was a relative increase in the calcium and phosphorus content. In tense agitated, depressed states there was a relative decrease, while in both acute and chronic dementia præcox the content was unchanged. In this disease the calcium content is lowest in the catatonic type. Ultra-violet radiation, although clinically of value in personality disorders, had no effect on the blood calcium and blood phosphorus. The authors conclude by stating that there appears to be a rational basis for calcium and phosphorus therapy in tense, agitated, depressed states.

R. M. S.

[112] **The influence of emotional changes on energy metabolism: Hypnotic experiments** (Der Einfluss von Gemütsbewegungen auf den Energiestoffwechsel: Hypnotische Experimente).—FELIX DEUTSCH. *Wien. klin. Woch.*, 1925, 1127.

THE influence of mental processes on metabolism is most striking in pathological mental states, normal variations being relatively slight and little being known about the interaction of mind and body under normal conditions. Grafe has recently shown in the case of a patient who was under prolonged experimental investigation of his metabolism and had long been in equilibrium, how the chance incidence of seriously distressing news, affecting himself and his family, caused him to lose two kilogrammes in weight in a few days while taking the same food and living the same mode of life. Experiments on the effect of intellectual effort on metabolism have so far yielded no decisive results, but emotional stimuli under hypnosis have been shown by Grafe to give in a certain number of cases, though not all, a rise in the metabolic rate; in another experiment Heyer and Grote found that persons given lasting post-hypnotic suggestions of emotionally stirring kinds, showed a considerable increase of excretion of phosphorus as compared with their output during other control periods, and in some cases this was combined with increased calcium excretion.

The author's experiments consisted in taking the basal metabolism in the usual way, resting and awake, then in hypnotic sleep, and then in emotional states produced in hypnosis and under hypnotic suggestion, letting these states alternate to imitate the variability of mood of the neurotic. The nature of the suggestions given was such as to touch on the special unconscious complexes of the person on whom the experiment was made, so as to produce the maximal emotional response and development of anxiety; the reason for this was that the author believes that organic disorders produced by emotions are usually due to those the source of which is not consciously known to the patient. Hence the experiments were further extended to include posthypnotic periods in which the emotion suggested was maintained, while the causal thought remained unknown to the now conscious patient. Under hypnosis an idea causing anxiety was suggested, and associated with the sight of a handkerchief in such a way that on waking the presentation of the handkerchief held up would arouse the emotion, but not the memory of its cause, while the dropping of the handkerchief would stimulate the complete memory to come into the normal consciousness. Throughout the metabolism experiments complete motor rest was maintained, and control basal metabolic rates were also taken on the previous day. The frequency of pulse and respiration was also noted in the various phases; after the experiment the emotional upset was removed by suggestion in hypnosis, and after a period of rest a final determination of the metabolic rate was taken.

Three cases are given in detail in which the complete series of tests was made ; in others tried, the subjects either did not remain in hypnosis or failed to go under while keeping the apparatus in the mouth. These three had all been hypnotised frequently before in the course of treatment of various neurotic disorders—one for asthma, one for hysterical heart symptoms, and one was a hyperthyroid case with vasomotor disturbances. The first case showed no material change from the B.M.R. during hypnotic sleep and suggested emotional stimulus (being back at home and searching for his father with the fear he had been injured) ; suggestion of calm and rest after this reduced the rate by 3.5 per cent., but after waking the restoration of the emotion at the sight of the raised handkerchief caused a rise of the pulse rate to 102 (from a normal 92) and a rise in the metabolic rate of + 18.1 per cent., with a subjective sensation of anxiety, though according to previous suggestion there was no increase of muscle tension and no movement. The patient's normal B.M.R. was that proper to his age and size.

The second patient had a B.M.R. 13.9 per cent. above that calculated for him ; this decreased by 8.9 per cent. in deep hypnotic sleep ; suggestion of playing football raised it to 7.8 per cent. above the resting value before hypnosis, and then suggestion of complete rest lowered it to 13.6 per cent. below the original resting value. During the football suggestion some leg movements occurred. Next came a suggestion of a tram accident in which he was vainly seeking his mother ; his pulse rose from 72 to 100, and he became acutely anxious to the point of collapse, his pulse thready and running, face pale, and general trembling, so that he had to be brought round. The metabolic rate taken just before the trembling began, had *sunk* to 26.6 per cent. below the resting value. All memory and ill effects were removed by further suggestion. The surprising lowering, instead of raising, of the rate with emotional stress is ascribed to a lowering from shock of the vascular tone and accumulation of blood in the splanchnic area, with cerebral anæmia. During the period following, when normal resting conditions were restored, the metabolic rate returned to its normal value, the reproduction of the emotion at the sight of the handkerchief raised the metabolism 6.6 per cent. only.

The third case had a basal metabolic rate of +29.8 per cent., the patient was an excitable hyperthyroidal woman, with a pulse rate of 104-112 ; neither the pulse rate nor the B.M.R. could be lowered by hypnosis and sleep suggestions ; the hypnotic suggestion that she was lost in a wood in a storm and lost sight of her mother produced only 6.1 rise in metabolic rate, but this persisted for a considerable time despite suggestions of calm, and also when the emotion was revived by showing the handkerchief after awakening from hypnosis ; when, however, the handkerchief was dropped, and the conscious posthypnotic memory of the imaginary experience returned, an acute anxiety reaction occurred with a thready pulse of 116 and collapse ; here again the metabolic rate *fell* to 14.2 per cent. below the original value.

Thus the author claims that these experiments show that emotional experiences, whether their cause be conscious or unconscious, may cause alterations of the metabolic rate, and he believes that this is the first time it has been shown that shock from acute anxiety will produce a sudden and considerable fall in the metabolic rate. M. R. BARKAS.

PSYCHOPATHOLOGY.

[113] **Circulatory ratings in mentally defective adolescent children.**—PHILIP J. TRENTZSCH. *Amer. Jour. Psychiat.*, 1926, v, 593.

A CIRCULATORY rating test was used during the war to aid in detecting aviators who were unstable, and therefore were not in condition to fly at that time. In applying this test to a group of psychotic cases it was found that 82.61 per cent. of the hebephrenic and catatonic types of dementia præcox patients rated low and that only 26.9 per cent. of the paranoid types rated low. Also only 11.2 per cent. of the manic-depressive patients rated low. In 4,800 necropsies reported by Lewis he found that 71.55 per cent. of the hebephrenic and catatonic types had a small aplastic heart, the incomplete development involving also the capillary system. Furthermore 75.5 per cent. of these had hearts of less than average weight, while only 7.8 per cent. of the paranoids had such. A revised test was applied to 100 adolescent children and 15 were found to have a low rating; the principal of the school stated that all of them were 'problem children,' and the histories obtained from both the teachers and the pupils revealed the existence of many neurotic symptoms. On testing 100 adolescent feebleminded children, only two graded low. One of them had an organic heart disease, both were of the familial type of feebleminded, and neither was syphilitic. As a group, the mental defects graded high in the circulatory rating test. In reading the literature on the pathology of mental defect one finds very little concerning the cardiovascular system. The circulatory test seems a valuable instrument for detecting a certain type of individual. C. S. R.

[114] **Intestinal hepatic and renal lesions in cases of amentia** (Lesioni intestinali, epatiche e renali in casi di amenza).—C. MAZZANTI. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 160.

OF twelve cases of mental confusion which came to post-mortem examination, eight showed macroscopic lesions of a hæmorrhagic, congestive and degenerative type in the digestive tract. In another case of mental confusion which did not show macroscopic lesions the patient had suffered from intestinal derangement which continued till death. Three cases studied microscopically showed scattered degenerative lesions of the mucosa of the intestine and also in the liver and kidney.

These lesions suggest that in confusional states there is absorption of intestinal toxins and that the liver and kidney, essentially defensive organs, may facilitate the intoxication by concomitant acute lesions (probably secondary for the most part) and by chronic lesions of long standing which interfere with their functional equilibrium. R. G. G.

[115] **A case of Alzheimer's disease** (Ein Fall von Alzheimer'scher Krankheit).—J. J. VISSER and G. P. FRETS. *Psychiat. en Neurol. Blad.*, 1926, Jan.-Feb., 10.

THE authors' case is that of a man of 57, whose symptoms were those of mental deterioration, loss of memory and attention, and interference with speech, of a somewhat quickly progressive character, while affectivity and outward behaviour were for a long time but little involved. So-called logoclonia and agrammatism were present in moderate degree, and there was some apraxia. The diagnosis was made during life and confirmed by pathological examination, characteristic changes being found to be widespread in the cortex, whereas in the corpus striatum little alteration was discoverable.

There is a good bibliography appended to the paper.

S. A. K. W.

[116] **Criminality in cranial injuries** (La criminalité des blessés du crane).—POROT. *L'Hygiène mentale*, 1925, xx, 205.

AFTER briefly discussing the etiology and pathology of cranial injuries the author points out that in their general evolution one can distinguish (1) the period of immediate symptoms; (2) following symptoms marked sometimes by confusional and delirious episodes which may lead to medico-legal reactions (fugues); and (3) late symptoms with residual psychic troubles which may be still more important from the forensic standpoint. These latter may be reduced to two groups of manifestations (*a*) diminution of general activity, initiative, attention, judgment and memory; (*b*) disturbances of mood and emotions, characterised by change of character, irritability and instability. All these sequelæ may take part in the problem of responsibility. In discussing the frequency of criminality among those who have been concussed or trephined, opinions are shown to differ. Some deny that there is any evidence of relationship, while Vervaeck and Mazel estimate that crime is incontestably more frequent in cases of cranial injury than in others, especially crimes of violence and probably sexual offences. The writer in 60 cases found 12 acts of murder and assassination, 14 of violence, 24 of theft, and 3 of incendiarism. In the deeds of violence and murder, epilepsy appeared often to be the direct cause. It is extremely important to establish the medico-legal value of such commotional traumata. A most minute subjective as well as objective examination must be made. A retro-anterograde amnesia can conceal the criminal act of some subjects. It is difficult to judge the psychic condition existing at the moment of a crime through this mental screen. The author thinks that cranial trauma should be taken into account when the subject has acted under the influence of a mental disposition, momentary or permanent, arising directly from such injury. There are cases of total irresponsibility where the criminal acts are committed quite unconsciously or in a twilight state; cases where responsibility is attenuated to a variable degree; and those where there is

entire responsibility. In the last, though there may have been grave cranial injury, the acts are carried out with mental lucidity, without any intellectual or moral obliquity, or any morbid state interfering with volition. It is considered that the rôle of relating such trauma to the genesis of crime must be carefully limited and one must be heedful of the sentimental exaggeration of public opinion. In war cases such a type of injury became a precious talisman to some, which was used as a defence in any crime or delinquency. Vervaeck, on the other hand, states that it is very difficult not to admit in head injuries the existence of a more or less important diminution of penal responsibility for antisocial reactions, even where responsibility appears to be established. It is difficult in the present state of our knowledge to affirm that at the moment of the criminal act such an individual possesses free will or has perfect comprehension of the gravity of his act. C. S. R.

[117] **Insanity and crime.**—William A. White. *Mental Hygiene*, 1926, x, 265.

The writer, referring to Einstein's theory of relativity, surveys historically the concepts of responsibility, guilt and punishment, and emphasises the necessity for discarding antiquated legal methods in favour of methods in harmony with modern lines of thought. He believes that questions of guilt and personal responsibility (in which terms are embodied the ancient principles of hate and vengeance), should be laid aside in favour of the social concept of the social usefulness and assimilability of the individual: that those individuals who are socially dangerous should be segregated, irrespective of what particular crime may have brought them to public notice; and that their segregation should continue not for a definite, prescribed time, but for so long as they continue to be a social menace. E. B. G. R.

[118] **Psychiatric examination of prisoners in Massachusetts.**—*Ment. Hyg. Bull.*, 1926, iv, 1.

In September 1924 a law became operative in Massachusetts calling upon the Department of Mental Diseases to make a psychiatric examination of all prisoners in houses of correction serving a sentence of over 30 days, and of all prisoners who had been previously committed to any penal institution. The first 1,500 prisoners thus examined were classified as follows:

Group I (281) consisted of 43 prisoners who showed psychotic symptoms, 7 who were feeble-minded, 79 diagnosed defective delinquents and 152 psychopathic delinquents. These prisoners were recommended for indefinite commitment in suitable institutions.

Group II (617) were alcoholics, 204 of whom were recommended for indefinite custody.

Group III (369) comprised prisoners who, on discharge, were likely to benefit by intelligent supervision and assistance.

Group IV included miscellaneous recommendations and cases in which no recommendations were necessary. E. B. G. R.

[119] **Classification of idiocy and imbecility** (Gruppierung von Idiotie und Imbezillität).—W. WEYGANDT. *Munch. med. Woch.* 1926, 755 and 828. IN these two lengthy articles the author discusses the lines upon which a classification should rest ; in the absence of full etiological knowledge we must group these cases according to pathological anatomy, cause, and clinical features as best we can. For practical purposes in treatment other divisions are made, according to mental age, capacity for training, conduct, etc. Especially in the higher grade cases, and those of endocrine or other physical defect with little mental disorder, each case must be judged on its merits.

He first deals with historical groupings, such as those arising from defective upbringing, or from defect of one or more senses, and points out how these may or may not be associated with real defect of mind. His next group is that of endogenous disorders of the brain matter ; he thinks the generally accepted proportion of these cases is too high (50 per cent.). In this category he places anencephaly (describing one case which Edinger reports, in which the patient lived to 3 years old), cases of partial absence of brain with idiocy, microcephaly, micrencephaly and congenital cerebral degenerations.

The third group is that of innate cerebral degenerations (he does not explain how these differ from those grouped above) : amaurotic family idiocy, Merzbacher-Pelizäus aplasia, hypertrophic tuberous sclerosis, and mongoloid idiocy. The fourth comprises secondary disturbances of brain development with degenerative skull development ; these are achondroplasia (though the patients are not always abnormal mentally) and pyrgocephaly. The fifth group consists of the forms of idiocy due to exogenous causes, encephalitis, meningitis, hydrocephaly, metencephalitis (including defects of intelligence and character, athetosis, Little's disease, torsion dystonia, and chorea, Sydenham's and Huntington's).

The sixth includes the syphilitic forms, idiocy, imbecility, epileptic cases, hydrocephalus, some forms of infantile paralysis and some of infantilism. The seventh includes endocrine disorders, cretinism, dysthymism, dyspituitarism, including dystrophia adiposogenitalis, and some cases ascribed to suprarenal and pancreatic defect. The eighth group is that of infantilism from a variety of causes, malnutrition, rickets, chronic diseases and circulatory disorders.

The ninth embraces cases due to exogenous toxins, such as alcoholism, whether in parents or in the child ; the tenth—epileptics, idiopathic and spasmophilic. The eleventh class is that of psychotic disturbances of development, including infantile hysteria, dementia præcocissima, schizophrenia, cyclothymia ; the latter usually in early puberty.

The twelfth includes cases of organic disease of the central nervous system, such as tumour, Friedreich's ataxia, disseminated sclerosis, etc. The thirteenth includes traumatic cases, whether the trauma occurs during birth or later.

In all these groups the author goes into some detail, describing the type of case, post-mortem findings, and possibilities of treatment, and he urges the importance of trying to place the case with every means of diagnosis and exhausting all possible treatment before consigning the patient to an institution for training, and also the desirability of making full post-mortem examinations in all cases. He deplores the lack of adequate institutions for these cases in Germany.

Finally he mentions that he has deliberately refrained from discussing the question of destroying worthless lives, as he thinks this is not the province of the doctor, who should do what he can for them and for preventing the occurrence of similar cases.

M. R. BARKAS.

[120] **The problems presented by general paresis.**—E. KRAEPELIN. *Jour. Nerv. Ment. Dis.*, 1926, lxiii, 209.

THE differences between general paralysis and cerebral syphilis are quite definite and may be explained by the fact that in the former the spirochæte succeeds in crossing the boundary between mesodermal and ectodermal tissues. This is borne out by the discovery of spirochætes in the cerebral tissue in general paralysis and the fact that the sheath of lymphocytes and plasma-cells surrounding the cerebral vessels is less dense than in cerebral syphilis. There must, however, be some change in the whole organism with lowered resisting power to account for the physical as well as the mental changes in this condition. The nature of this change has not been discovered, though metabolic changes, in the form of failure in nitrogen equilibration, in disposal of foreign toxins and the formation of intermediate products which circulate in the blood, are suggestive. The later development of general paralysis is a problem which awaits solution ; the explanation may be sought in differences in the spirochæte or in the patient. Certain rather inconclusive evidence is adduced in favour of the former thesis. The evidence in favour of the latter contention is more definite. Differences in age, sex and racial incidence are very striking, and several other factors have been suggested in the same connection, such as the incidence of infectious diseases, alcohol, and the efficiency of treatment. Of these alcoholism as a contributory factor has the most evidence to support it. Several suggestions as to fruitful lines of research are given.

R. G. G.

[121] **Polymorphic insanities** (Les délires polymorphes). — R. TARGOWLA. *L'Encéphale*, 1926, xxi, 18.

THE classification of mental disorder elaborated by Magnan was based essentially on etiology and clinical features, and was applied to hallucinatory delirium, which he divided into chronic delirium systematically developed, and

the polymorphic delirium of degenerates—apart from alcoholic and toxic delirium.

The second group, involving mental degenerates, includes clinically many divergent features. These polymorphic insane states are kaleidoscopic in their variability. They must be separated from chronic hallucinatory psychoses and from dementia paranoides. A curable percentage, however, were noticed by Kraepelin and Bleuler, who were inclined to put such cases in the manic-depressive group; but the author is of the opinion that their unique character calls for a separate category, hence he marks off polymorphic delirium in order to prevent confusion.

The author describes at length a case of delirium with rapid alternations of mania and depression. He analyses the mental state and gives full details of the somatic disturbances, particularly of the vaso-vegetative disequilibrium —i.e., marked vagotonia. He regards such cases as arguments in favour of Magnan's view of curability, as against Kraepelin's view of chronicity of polymorphic delirium.

Bearing in mind, however, the somatic disturbances frequently found, intermittent digestive trouble, dysmenorrhœa and vagotonia, a chronic variety of polymorphic delirium has to be distinguished. The differential diagnosis from manic-depressive and periodic insanity, and from paranoid states, is fully considered, in order to emphasise the need for regarding polymorphic delirium diagnostically and prognostically as a separate clinical entity.

E. MILLER.

[122] **Psychoanalytic study of a case of organic epilepsy.**—K. A. MENNINGER. *Psychoanalytic Rev.*, 1926, xiii, 187.

A CASE is here presented of a typical epileptic syndrome arising upon a basis of definite structural cerebropathy which was studied by the psychoanalytic method. Although thorough systematic investigation was impracticable, the dreams, free associations, and clinical developments made it seem clear that the occurrence of convulsions was in part psychogenically determined. Relief from the intolerable pressure of unconscious conflicts was accomplished by the epileptic flight, a characteristic reaction type. The improvement was probably due to a combination of (1) transference, (2) catharsis, and (3) environmental alterations. The author believes that this study adds confirmatory evidence to the thesis that the manifestations of structural ('organic') pathology are associated with, if not determined by, psychic mechanisms which are accessible to study by the psychoanalytic method with, in some cases, objective clinical improvement.

C. S. R.

PROGNOSIS AND TREATMENT.

[123] **Psychoanalytic notes on Coué's method of self-mastery.**—KARL ABRAHAM. *Internat. Journ. of Psychoanalysis*, 1926, vii.

THIS is not a criticism of Coué's work and method but an attempt to understand it by the psychoanalytic method.

The first point to be discussed is that patients are treated en masse without regard to their number or to the difference of their affections and requirements. The success or at least the fascination of the method is undoubtedly a phenomenon of "Group psychology." Coué's power lies in his position as the leader. Suggestion is a manifestation of one person's libidinal attachment to another who represents to him in his unconscious either his father or his mother. To the members of a group the leader takes the place of the father, that is, replaces the super-ego in the individual members. Thus the members of a group have, as it were, a common super-ego; they are allied to one another by reciprocal identification. Each member feels within himself the power of the whole group. All Coué's adherents have not of course seen him; they may only have read about him, but in spite of this the fiction is maintained that the leader loves each individual equally (the just father). He gives one and all the same formula. Further, he possesses the powerful 'mana'; he can banish all ills with a formula; he possesses the omnipotence of thought and the magic word. The leader allows everyone to behave as if he were Coué himself. They may identify themselves with him or dispense the 'mana.' This putting oneself on an equality with the leader (father) satisfies an unconscious (infantile) wish. In hypnotism trouble is likely to arise from an awareness of the erotic nature of the relationship. In auto-suggestion this is avoided partly because of the large numbers of people receiving treatment, and partly by the individual's concentration on the increase of his power. It might be said that Coué's system is a flight from hypnosis (eroticism). In treating such large numbers the physician still further increases his sense of power.

Again, this system tends to dispel the narcissistic overestimation of the body; the emphasis is displaced from the illness to the miraculous power of self-influence. The idea of the power of self-influence also tends to destroy the neurotic's feeling of inferiority. The effect of Coué's method depends on the individual becoming a member of a group. He thus becomes credulous and suggestible. The method appeals to the intellectuals because by becoming members of a group they are saved the struggle with resistance which intellectual and artistic sublimation entails. The success of the method depends on the peculiar way in which it deals with the Œdipus complex. It directly charges the patient to identify himself with his father: to become possessed of a part of his 'mana,' without divulging the libidinal character of the act. The effect of autosuggestion itself is explained as being due to a regression of the libido

past the parental fixation stage to the narcissistic : this enables primitive ideas, e.g., omnipotence of thoughts, to be revived. The super-ego, identified with Coué, directs its magical methods towards an object, the ego, just as the infant directs his magical methods to external objects. This permission to enjoy license of an infantile nature relieves the individual of some of his sense of guilt. His identification with the group also acts in this direction. In mania the functions of the super-ego are suspended, and the ego enjoys a much desired freedom and consequent raising of self-esteem. This happens in a small way in Coué's method, and the patient feels in better health ; but in contradistinction to the revolt of the ego in mania, everything is done with the approval of the super-ego.

The formula adopted in Coué's method needs further examination. The main one is exactly like the magic spells of savage races and of civilised ones too. Coué's bit of string and its twenty knots remind us of the Roman Catholic rosary, and of a similar device—the Thibetan praying-mills. Obsessive patients frequently pick on particular numbers and repeat them. The impression is that the whole of Coué's work is that of a person with a latent obsessional neurosis. Obsessional patients not only repeat certain acts a certain number of times but invent formulæ to help them to combat an obsession. Coué's repetition also reminds us of the verbigeration of certain psychotic patients. It has been shown that membership of a group dulls the critical faculty and opens the way to the unconscious. It is this unconscious that the formula is intended to influence, and, as the psychoanalyst knows, the unconscious has created in the illness an outlet for certain tendencies that have been repressed. In both the sayings and doings of an obsessional neurotic there is a pleasure tendency and a punishment tendency—present at one and the same time. The Coué formula serves this double purpose. The good Catholic tells his beads a certain number of times as the Coué prototype tells his knots. It is just in the obsessional case that ideas of omnipotence are strongly present, and it is also there that formulæ are made use of to combat the illness.

Briefly, the economic significance of Coué's formula for both the conscious and unconscious is a manifold obsessional symptom. Firstly, its manifest meaning as a consolation and a support is, that in copying the master, the disciple identifies himself with him. Secondly, it serves as a self-punishment —if the illness stood to the unconscious as a punishment, one form of penance is exchanged for a less unpleasant form. Finally, the rhythm and time of the formula and the manipulation represent the prohibited activity in the subject's unconscious, an activity now carried out with his father's consent.

It will be seen that the method of psychoanalysis stands at the opposite pole to Coué's self-mastery.

DAVID MATTHEW.

[124] **Report on the psychotherapeutic out-patient department of the clinic for nervous and mental disorders in the university of Vienna in the year 1922-1925** (Bericht über die Tätigkeit des psychotherapeutischen Ambulatoriums an der psychiatrisch-neurologischen Universitätsklinik in Wien, 1922-1925).—HEINRICH KOGERER. *Wien. klin. Woch.*, 1926, 330.

THIS out-patient department was opened in October 1922, and in the three years it has been working has treated 340 patients, of whom 171 were discharged improved, 35 not improved, while 134 did not return. Of those treated until discharge the percentage improved was 83.6 in the first year, 70 in the second year, and 92.4 in the third year. The reasons for these variations are considered to be variations in staff and general method used; by the third year methods of training workers and of treatment had been worked out, so that the high percentage of this year should be maintained. Some attempt is made to see the discharged patients again later, and on discharge they are invited to return should any relapse occur (the numbers doing so are not given). After-care and help with regard to social conditions is realised to be important, and arrangements for this are being made with the city authorities.

The method of treatment used is essentially psychotherapeutic, though medicines are sometimes used in addition. As a rule each patient is seen twice a week for about two months, and very seldom longer than six months (the duration of each interview is not given). The patient is asked for the chief facts of his history, and invited to tell his troubles at length and in his own way, with questions only where necessary, while he becomes used to the doctor and gains confidence in him. This first part of the treatment is called 'analytic,' and leads to the discovery of the mental cause of the disorder. When this has become evident to the physician, the next stage is that of getting the patient to take the same view, if he has not already done so in the course of explaining himself. The final and most difficult stage is called 'synthetic,' and involves enabling the patient to overcome his difficulties and regain his equilibrium, and the methods of doing this vary greatly with the individual and his life situation. When he feels able to carry on without help, he is given an interval of trial and discharged if he remains well for this time.

Psychoanalysis is not used, partly on account of the length of the treatment and partly because the author, while accepting much of the analytic theories of the causation of neurosis by mental conflicts, also believes that a large part is played by a neurotic constitution, which consists mainly in a lowered capacity for resistance to disturbances in the equilibrium of pleasure, so that the chief task of the doctor lies in investigating this defect and finding the best ways to lessen its effects; the mental conflict is also important, in so far as any painful experience may precipitate the outbreak of a neurosis. At the same time he finds that the refractory cases are chiefly among those

in whom no psychogenic cause has been discovered. A certain number of patients who lack power of co-operation or time for psychotherapy are helped by suggestion methods, under which are included hypnotism, drugs, and various forms of physicotherapy, and these, especially hypnosis, are also used in addition to the usual psychotherapy in some cases. Adler's 'organic inferiority' is found even more important than sexual traumata. The author implies that his methods are preferable to psychoanalysis because he objects to the idea of the 'transference'; he appears to ignore the large part played by transference in his treatment and the possibly lasting dependent attitude of the patients. M. R. BARKAS.

[125] **Psychotic children: treatment and prophylaxis.**—A. A. BRILL. *Amer. Journ. Psychiat.*, 1926, iii, 358.

THIS presentation is of a purely clinical nature; its purpose is to pursue the development of some psychotic children into adult life, with the object of studying reaction types and of drawing conclusions concerning treatment and prophylaxis. The histories are given of several psychoneurotic children, some showing definitely schizoid reactions and others the syntonic reaction of Kretschmer and Bleuler. The author feels we have reached a stage in psychiatric diagnosis where one can speak of tendencies just as one does in physical diagnosis, and accurately predict later psychoses or advise as to prophylaxis. He recommends, not the psychoanalysis of young children, but rather the application of psychoanalytic principles in diagnosis and in the re-education of the parents and re-adjustment of the child's environment.

E. B. G. R.

[126] **The psychic element in human work** (O elemento psychico no trabalho humano).—CARLOS PENAFIEL. *Archivos Brasil. de hyg. ment.*, 1925, i, 9.

IN these days the workman works mostly as a psycho-physiological machine. The organization of industrial work on scientific lines has only been started of late years through practical experiments. The writer shows how medico-psychological examinations can discover the aptitudes of each individual, and calls for the setting up of psychological laboratories which should be applied to the scientific study of the labour of workmen and the education of children. He would like to see founded in Rio de Janeiro a Central Institute under the patronage of the Brazilian League of Mental Hygiene, an institute with practical psychological aims applied to various technical researches and with the threefold purpose of promoting (1) justice; (2) the education of the child in the workshop and at school: (3) social economy, by seeking to establish those mental qualities which would furnish the best result for industrial work and the general psychological conditions capable of insuring the best and greatest output from this work, and still more, the instructive means which would raise to the maximum the faculties of which industry and commerce have need. C. S. R.

[127] **Intravenous injection of bismuth salts in general paralysis** (Les injections intraveineuses de Bi dans la paralysie générale).—RUCHATEAU. *Jour. de neurol. et de psychiat.*, 1925, ix, 567.

Two cases of general paralysis treated with bismuth tartrate, with a fatal termination, are described.

Both cases had withstood an initial intravenous injection of bismuth; the second dose in each case caused an almost immediate convulsive seizure with death. Unfortunately no post-mortem examinations were obtainable. The publication of these two cases is extremely useful in pointing out the danger of bismuth therapy in syphilis. Cases of this kind are known, but only a very few have been published, and the authors' work may be a timely warning against the too vigorous bismuth therapy of syphilis of the central nervous system.

E. A. C.

[128] **The malarial treatment of general paralysis.**—JOHN DUNNE. *Jour. of Ment. Sci.*, 1926, lxxii, 343.

THE conclusions drawn are from the treatment of 25 cases which had been a long time in the Grangegorman Mental Hospital, Dublin, and which were in an advanced condition of paralysis. In each case the diagnosis was confirmed by serological tests. The most noticeable features were : (*a*) the recovery of control of sphincters in all cases except two out of 20 in which incontinence was a feature ; (*b*) the marked physical improvements (only three patients out of the 25 remained in a weak condition) ; (*c*) the ease with which the malaria could be controlled by quinine ; (*d*) in no case was there recovery of the light reflex or of knee-jerks, or of speech where these were lost ; (*e*) the greatest improvement followed in those cases where the temperature was very high, and where the course of the malaria extended for more than ten rigors.

Eight out of 25, or 32 per cent., greatly improved. This result corroborates the findings of others who have been engaged in this work. The death-rate (five out of 25, or 20 per cent.) exaggerates the danger of the treatment, as in only one out of the five was death directly caused by malaria. The malarial treatment is regarded as undoubtedly arresting the disease in its progress, and if given in the early stages before there is extensive destruction of the brain-cells, should offer a reasonable hope of cure.

C. S. R.

[129] **The significance of gain in weight in the malaria treatment of general paralysis.**—H. A. BUNKER. *Arch. of Neurol. and Psychiat.*, 1926, xvi, 329.

IN a series of malaria-treated cases of general paralysis, a gain in weight above the pretreatment level took place during the first three months subsequent to treatment in 80 per cent of the sixty-two patients. Such an advance was found in about 50 per cent. of the mentally unimproved cases ; but it occurred

in 95 per cent of the patients who achieved full remissions, and of those who showed more moderate mental improvement. Failure to recover part or all of the weight lost during the actual course of the malarial infection seems definitely to be of unfavourable prognostic significance. On the other hand, a marked and rapid rise of the posttreatment weight-curve is often exactly coincident with well-marked mental improvement, and is of favourable prognosis up to a certain point ; but this improvement is sometimes only temporary, and even in the presence of a maximum response from the standpoint of weight increase, a maximum result as regards the mental outcome may be prevented by the presence of other factors, such as organic damage beyond the possibility of functional restitution. The posttreatment gain in weight is probably more or less intimately connected with the mechanism of the malaria therapy itself as suggested by the facts that : (1) many patients exhibit it who show no mental improvement ; (2) the maximum weight reached is not infrequently considerably in excess of the usual weight in health ; (3) the maximum gain is often temporary, and (4) a similar phenomenon has been observed in connection with foreign protein therapy of other types. The principal significance of the gain in weight here described consists in the suggestion of a fundamental alteration in the vital processes of the organism, which in some obscure way underlies the striking therapeutic results following malaria treatment.

R. M. S.

[130] **Mental inefficients : treatment and punishment.**—W. A. Potts. *Brit. Med. Journ.*, 1926, i, 857.

Recent reports by the Prison Commissioners show how much their attitude has changed towards crime and delinquency. Dr. Charles Goring in the early years of this century dispelled the illusion that there is a criminal type. The criminal is of the same clay as others, only he tends to be a little inferior, physically and mentally. Delinquents come from every class, though poverty predisposes to crime, especially stealing. Goring's investigations paved the way to the idea that individual examination is essential. It is being more and more recognized that severe punishment is not necessarily followed by less crime. The habitual offender, getting more and more severe sentences, often goes on to commit worse offences and to commit them more frequently. The young delinquent is most likely to respond to treatment, and Goring proved that the habitual offender nearly always begins his criminal career between the ages of 16 and 19. Potts thinks that nine or ten is a more important age and early cases should have full investigation. If treatment rather than punishment is to be the aim, we ask what treatment ? We can only tell by individual examination physically, intellectually, and psychologically, and by learning all possible facts about the subject, his environment, his training or lack of training. It must not be supposed that every case can be reformed. Some are beyond treatment and there must then be segregation. The mentally

defective cannot be cured and only a few can be trained to lead a satisfactory life. The number of mental defectives among delinquents or those in prison is not large. East records them as from 3 to 5 per cent. High-grade feebleminded are difficult to recognize and any such examination can never be made in court, which is unfair to the delinquent. Only a limited number of those charged at the courts are available for individual examination, for which thorough and competent experts are necessary. Increased demand will in time doubtless supply such experts. The selection of suitable cases for investigation should be by the magistrate and court officials, guided by expert advice. Careful examination is required in young delinquents in cases of stealing; in offences dangerous to the public; all sex offences; in all who look ill or who are suspected of having any physical defect or disease; and in all those offenders who are not understood. The important mental defective should first be excluded; then those who have any mental disorder picked out. Though these are only about one-half per cent., they may be a serious danger to the community. The possibility of encephalitis lethargica must be borne in mind. Physical abnormalities are more easily recognized than mental ones, are easier to treat and may be connected with a feeling of inferiority. Constitutional disorders in the earliest stages should be discovered. We must also recognize cases of mental conflict. Difficulties may be caused by an extreme father- or mother-complex, by an unhealthy attitude owing to absence of moral training or to a hyper-Puritanical upbringing, or because of little or no opportunity for healthy recreation. If punishment is of limited value, is discipline of no use? It is essential, but never should lead to repression through fear. Probation is one of the most effective means of dealing with delinquency, but to be effective it must last a much longer time than usual. In many cases it should not be less than five years. Better trained probation officers are required and a thorough examination at first should determine its conditions. The indeterminate sentence is the only way of dealing with some offenders. All magistrates should be compelled to attend lectures on psychology, sociology, psychiatry and penology. Classification in penal institutions ought to be according to character and ability to reform. In all cases where parents are incapable of providing for the moral education of their children, the court should have the power of boarding out in a suitable foster-home.

R. S. C.

[131] **The art of oratory and its psychotherapeutic value** (Die Redekunst und ihr psychotherapeutischer Wert.).—FRIEDRICH KELLER-REYMOND. *Münch. med. Woch.*, 1925, 2190.

HERE it is pointed out that while many phobias are realised to be neurotic and unreasonable, the very general phobia of speaking in public is seldom treated and overcome, yet it is important for every educated person to be able to express his thoughts clearly and convincingly before an audience or meeting.

The author urges the value of training in the art of oratory as being most valuable, alike for the neurotic and for the normal person, in that it cultivates self-confidence, clear thinking and speaking, control of emotions and their bodily expression, strengthens the will, and trains the speaker to prepare his case thoroughly and expound it logically, while it also induces presence of mind in dealing with interpolations and replying to controversy. He has seen many a timid, shy, distracted neurotic gain self-control by such a training, which has altered for the better his whole character and reaction to life.

M. R. BARKAS.

[132] **The treatment of schizophrenic disorders with calcium** (Ueber Kalziumbehandlung schizophrener Erkrankungen).—WILHELM DODEL. *Munch. med. Woch.*, 1925, 1462.

THIS is a preliminary report on the subject, which the author thinks is worth publishing, even on a small number of cases, since the improvement obtained is so striking that it is worthy of widespread trial. It also bears out the views published by Sagel that anaphylactic processes play a part in this disease, since these cases give a positive reaction to intracutaneous beef-albumen, other psychoses being negative.

Dodel has treated 14 cases with intravenous injections of 'Afenil,' the calcium preparation of Knoll; he gives 10 c.c. every two or three days in a series of 30 injections. His most striking successes were with four cases of periodic acute catatonic excitement, in which there had been regular prolonged attacks of excitement every month for seven to ten months. In all four the excited periods either ceased or were very greatly diminished in severity, one patient having been now free for five months, having regained insight and capacity for normal activities and interests, while the other cases have shown similar improvement for three months; in all cases the remaining autistic characteristics of the intervals improved equally after the 'afenil,' improved emotional contact with the environment being maintained. All the patients seemed to appreciate the improvements and while usually objecting to the first injections, later co-operated and even asked for them.

One case was that of a man, age 43, of 22 years' duration, with typical mannerisms and considerable dementia, who was found to react by an increased degree of extroversion, which led to his attacking persons about him during an excited phase of unusual violence, and he returned to certain actions which had been present years before, but there was no improvement and he lapsed into an autistic stupor. The remaining cases were of various types still changing in their reactions and fairly recent; it is too soon to judge how far any improvement had occurred in these, but the author's impression is that on the whole the treatment does seem to tend to remove or render latent whatever process underlies the acute development of schizophrenia, and he recommends its trial in all early cases, as being generally beneficial, and possibly curative in its effects.

M. R. BARKAS.

[133] **Psychocatharsis and psychoanalysis** (Psychokatharsis und Psychoanalyse).—C. ROMER, *Münch. med. Woch.*, 1926, 525.

MODERN psychotherapy has a variety of methods, each with its good points; the patients wish to be relieved of their symptoms but attribute them to external causes and chance, and show resistance to the disclosure of their underlying psychological connections, while the critical point comes with all methods when the causative factors have been discovered, but the symptoms still remain.

As a routine the author takes a brief history and makes a thorough physical examination; he then starts with a detailed exploration of the patient's life from childhood to the present, finding that this often leads to a sort of hyperamnesia and the disclosure of many complexes, and in quite a number of cases (47 out of 116) this sufficed to restore the working capacity. Failing this, deeper methods are used, strict psychoanalysis, and the psychocathartic method of Frank. The choice of method depends on an intuitive feeling in the physician, but a change from one to another may be necessary. Thus one case with mild depression and headache was improved after nine months' analysis, but the patient still had headaches; two years later she returned asking for hypnosis; in this no fresh material was brought up, but much more emotion was displayed and the abreaction gave relief. He remarks that in analysis there is a risk of telling the patients one's own surmises and revealing matter they are not able to tolerate, such as the Œdipus complex, which may upset family relationships. He specially condemns casual interpretation of dreams on symbolic lines, without analysis of their actual meaning to the dreamer.

The difficulty of transference occurs in every form of psychotherapy; but the author thinks that the cathartic method offers less objection, since the doctor can keep the patient at a distance and on an impersonal basis and speak more readily of sexual matters under the screen of hypnosis: the patient does not become so dependent on the hypnotist as in cases treated by hypnotic suggestion. A further advantage of this method over analysis is its shorter duration, though it should not be too brief, lest repression recurs; it is also more suitable for most people, requiring less experience and training than analysis.

After the disclosure of complexes by any of these methods, some suggestion and re-education in sublimation on the persuasive method is required.

He has made a statistical summary of his material, and finds that of 116 cases roughly 91 per cent. of the patients were capable of resuming work and remaining fit for it, while 50 per cent. of all cases remained free from symptoms. This shows a marked improvement on the methods of previous years, his cases published in 1911 showing 72 per cent. capable of work. The main etiological factors he found were as follows: of 116 cases sexual factors in 34 per cent. men, 82 per cent. women; excessive ambition in 40.8 per cent.

men, 9 per cent. women; instinct of self-preservation in 24.5 per cent. men, 9 per cent. women.

He regards as indications for psychoanalysis chiefly refusal of hypnosis (*e.g.*, on religious grounds) or inability to be hypnotised. M. R. BARKAS.

[134] **What practical medicine should learn from psychotechnical work** (Was die praktische Medizin von der Psychotechnik lernen sollte).—POPPELREUTER. *Münch. med. Woch.*, 1926, 630.

THE author criticises the present haphazard methods used by doctors for estimating the working capacity of patients when such an opinion is required, and suggests that unless the medical profession takes some pains to gain knowledge of this department, it will all go into the hands of factory experts without a medical training, whereas it might open a large field for doctors who are unable to find posts.

He emphasises the fact that we have very little accurate knowledge of the normal range of capacity for work of various kinds; in testing heart efficiency a rough and ready examination is made, but even here we do not know any accurate curves of large numbers of cases showing the incidence of various capacities, while for all sorts of common measurements, pulse, temperature, blood-pressure, etc., there are no statistics of the range of variation within normal working capacities.

He illustrates his point by giving a series of graphs or frequency curves correlating percentage numbers of groups with capacity for endurance, appreciation of form, comprehension of verbal orders, technical skill, while another series correlates the height of apprentices of different age groups with the incidence of each set of values; in most of these frequency curves there results a typical form, the maximum being about the mean value, while smaller groups fall on either side into those less and greater than the mean. He contrasts such curves with the inaccurate ones found by a mere subjective estimate of working capacity. He shows further, from his own work of the after effects of head injuries, that the curves given for number of times of bending down and lifting up weights show a somewhat different form in groups of normal people from those in groups of injured ones, the latter being more closely grouped around the mean, which is of a lower value; yet a large proportion come within the overlap with normal ranges, and though some probability of defect occurs in the injured patients, it is not, in most cases, outside normal limits of variation, only a small proportion falling there; this, no non-statistical observation would have shown.

He also stresses the fact that in estimating fitness for work—in insurance, compensation cases, etc.—the tests given must be of an appropriate nature; thus a slight weakness or slowness of movement may be quite incapacitating to a man whose work demands fine and rapid co-ordinated movements of the limb. He argues that psychotechnical training would be a valuable addition to medicine and is well worthy of study. M. R. BARKAS.

[135] **Psychotherapy for the specialist in organic disease** (Die Psychotherapie des Organspezialisten).—RUDOLF SCHINDLER. *Münch. med. Woch.*, 1925, 1517.

THIS article is a commentary on one by Krecke in a previous number, on 'asthenic women and the mania for operations.' The author disputes Krecke's view that the asthenic patient is especially prone to get herself operated on for functional disorders, believing that all types of constitution are liable to this tendency; he also disagrees with the view that such patients ,who usually first consult the specialist in diseases of the organ where their symptoms are localised, should be referred to a nerve specialist. He believes that they are much more ready to confide in, and benefit by psychotherapy from, the specialist who has thoroughly investigated their physical condition, and that it is of the greatest importance that the general physician and specialist alike should have some skill in psychotherapy and look in their functional cases for the psychogenic factor. He urges that if the state insurance scheme would realise the importance of spending money on this form of treatment, which at present is too costly in time for its general application, much saving would result in the long run in the expenses of hospitals, sanatoria, etc. He concludes by saying that one group of cases will not respond to psychotherapy, viz., those whose home conditions are so intolerable that the rest and peace of a stay in hospital more than compensates them for the discomfort of an operation; but he fails to draw the obvious conclusion that in-patient clinics are required for these patients. Generally speaking, however, he agrees that it is most important for the medical and surgical specialist to avoid operations in doubtful cases and to consider the possibilities of psychogenic causation of symptoms and their relief by psychotherapy.

Krecke replies that at present few specialists have the necessary experience of psychotherapy, or time to practise it, and that the essential thing is for them to recognise the neurotic case and refer it to the psychotherapist, with a strong suggestion and reassurance that no physical disorder exists.

Both insist that there is too great a tendency in the specialists of to-day to consider only their own particular sphere of the body, and fail to deal with the patient as a whole and as a human being.

M. R. BARKAS.

Reviews and Notices of Books.

Collected Papers. Volume iv. By S. FREUD. Authorised translation under the supervision of JOAN RIVIERE. (The International Psychoanalytic Library, No. 10). London: Hogarth Press. 1926. Pp. 508. Price 21s. net.

THE last volume of the collected papers consists of two parts. The first eight papers are on what is termed metapsychology, that is to say the theoretical deductions which Professor Freud has drawn from his observations of his clinical and other material. The sympathetic general reader will turn to these with the expectation that here at last he will find a firm psychological basis for what at first sight appears far-fetched in psychoanalytical literature, but which may after all hang together with the more physiological treatment of psychology, but he will be disappointed, for we still find the purely empirical standpoint. Psychoanalysis has established certain "facts" and everything must be explained on these facts. To quote from another essay of the author's: "I presuppose their (the findings of psychoanalysis) soundness and I then make use of them to explain . . ." This is the attitude all through this first part. For example, he admits that "we must recollect that all our provisional ideas in psychology will some day be based on an organic substructure . . . It may be that—when we penetrate deepest and furthest—sexual energy, the libido, will be found to be only the product of a differentiation in the energy at work generally in the mind. But such a statement is of no importance." And so we go on with libido, narcissism, eroticism and the rest. For instance, a promising chapter heading is "Instincts and their vicissitudes," but this is concerned with sadism, masochism, exhibitionism, scotophilia, etc., and we look in vain for any link with our more familiar instincts about which the orthodox psychologist has taught us. The objection may be raised that Freud is not discussing orthodox psychology but psychoanalytic theory, but after all orthodox psychology is no Dodo, but rather a flourishing member of the family of the sciences, and the correct road to the difficult subject of psychoanalysis ought to be through orthodox psychology and not by initiation into a cult from a previous condition of psychological ignorance. Freud himself and all his reputable followers are able and distinguished neurologists and psychologists and it is a pity that they do not give more assistance to the neophyte to bridge the gap between these established sciences and the new discoveries.

The second part consists of sixteen papers on applied psychoanalysis. These deal with various non-medical subjects, ranging from art, through telepathy, to demoniacal possession and, providing psychoanalytical interpretation is accepted, they are full of interest and instruction. Like the other volumes of these papers it is imperative that all who pretend to take an interest in modern psychology should read this last one, but perhaps only the devoted disciples will find full and complete satisfaction therein.

R. G. G.

Maudsley Hospital. Medical Superintendent's Annual Report for the year ended January 1925.

THE total number of cases treated in this, the hospital's second year, was 1,304, and the number of in-patients 590; the corresponding figures for the first year were 1,012 and 452.

That aspect of the policy of the hospital which gives rise to most questions is the admission of cases whose symptoms are extremely diverse as regards severity. Two types of comments are extremely frequent, that the patients in the quieter wards are not 'mental' at all and that the more acute ones do not differ from those in ordinary mental hospitals. Neither of these comments is accurate, yet taken together they seem a sufficient answer to a common theoretical assertion that the reception or retention of severe cases will deter application from suitable lighter ones and that the treatment of the two should be entirely divorced. Occasionally visitors to certain acute wards take exception to the treatment here of cases in which slight mental symptoms co-exist with well defined physical diseases, such as exophthalmic goitre and chorea. If one holds the view that mental disorders are always and necessarily the expression of bodily ones, then it is essential to admit such cases.

Roughly, three-fourths of those treated in the wards had first been examined in the out-patient department. It is in relatively few cases that continued out-patient treatment is undertaken where the disorder is of quite recent origin and hopeful form. In the majority of cases where full hope of recovery exists sooner or later admission is arranged so that the patient may have the greater advantage of treatment in the wards. Out-patient treatment for cases of the more chronic types can as a rule be only palliative. With this limitation it is of great value in very many cases. Statistics show a large proportion "still attending," a considerable number discharged "improved," relatively few "recovered."

With regard to in-patient treatment the facilities for open air treatment have been extended. Massage, remedial exercises and medical electricity have been extensively used. Occupational therapy has also been extended and a special occupations officer has been appointed to deal with those patients who are confined to bed or unfit to leave the wards.

In connection with the specific rôle played by oral sepsis in the causation of neuroses and psychoses a direct connection does exist in a certain number of cases, and in a far larger group its treatment is an indispensable measure in procuring restoration of the general health and corresponding mental improvement. An extensive trial has been given to vaccine therapy.

The malarial treatment of general paralysis has for various reasons not been used extensively. Tryparsamide rather was adopted in practically all cases of neurosyphilis admitted in the second year. Briefly it may be said that the method appears safe but that it is doubtful whether results are of a distinctive kind such as would clearly be unobtainable by means of other arsenic

compounds. Of the 20 patients, 2 died and of the rest 13 showed improvement clinically or as regards the serological findings.

There has been a marked increase in the number of cases resulting from encephalitis lethargica. The great majority were brought up on account of mental symptoms of some kind. The initial attack had often been overlooked and the diagnosis missed. Distinction from ordinary melancholia presented difficulty in quite a number. Association with exceptional mental stress shortly before onset was a notable feature in some. There was found no constant proportion between the degree of the physical changes and the mental symptoms. The latter have mostly been emotional depression, retardation of thought and action and drowsiness. Morbid restlessness has been seen in chiefly in children under eight, and the well-known moral deterioration in older children and adolescents. Numerous drugs and organic extracts have been tried without much effect. Periods of improvement have frequently coincided with the taking of salicin in some cases and acid sodium phosphate in others, but the results are inconstant and inconclusive. The cases mostly have been treated with subcutaneous injections of hyoscine hydrobromide. The effect of each does is only transitory and palliative. Remarkable results, however, have been produced upon mental phenomena of two kinds: (1) alternating drowsiness and restlessness, and (2) mental retardation. The drug does not arrest progress but appears to produce no dangerous or harmful effect.

Somnifen, which has been advocated in conditions of restlessness, particularly those associated with hallucinations, was tried in 12 cases. A satisfactory hypnotic effect was obtained but n no case was any permanent benefit produced.

Glandular extracts have been given a further fairly extensive trial and the conclusions are: The impressions gained last year as to the value of thyro-ovarian and parathyroid have been strengthened. The former has seemed to benefit menopause cases of depression and anxiety with flushings and other vasomotor symptoms and also younger depressed patients with amenorrhœa. In a number of cases its use has been followed before long by menstruation when this had been absent for some months. Parathyroid has seemed to be of considerable use in anxiety cases with signs of hyperthroidism especially when combined with calcium. Some arteriosclerotic cases have also shown improvement with it. Pituitary was tried in certain cases of encephalitis with an asthenic state but its effect was to increase rather than to remove the anergia. Thyroid treatment again proved disappointing in most cases though some improvement was produced in a few cases with hyperthyroidism.

As to the general results of treatment: of a total of 590, 136 were still in hospital, 27 died and 427 were discharged. Of the 427 discharged, 53 were against advice: of these 22 were improved (41 per cent.), 31 (59 per cent.) not improved. Of 374 discharged with approval, 112 (29 per cent.) were

recovered; 151 (40 per cent.) improved and 111 (31 per cent.) not improved. As regards the results in cases of psychoses, the following table is given as before (1) to indicate roughly the proportion of cases here that at some stage of the attack might have been certified; (2) for comparison with results at ordinary mental hospitals. It should be clearly understood that differences in the main depend on the power existing here to select cases:—

Discharged against advice.		*Discharged with approval.*				*Still in*	
Improved.	*Not improved.*	*Recovered.*	*Improved.*	*Not improved.*	*Died.*	*Hospital.*	*Total.*
7	19	32	76	62	22	64	282

During the past year the work of the Almoner's department has increased. A large number of patient's homes have been visited and information required by the doctors has been supplied. After Care work, too, has been considerable. For five months of the year, following an intensive course given to social workers, three students have been in training in this department.

Diseases of the Nervous System. By H. CAMPBELL THOMSON and GEORGE RIDDOCH. Fourth edition, revised. With 12 colour and 12 black-and-white plates and 102 figures in the text. London: Cassell and Co. 1926. Pp. 541. Price 16s. net.

THE present edition of this well-known textbook shows many alterations, which should enhance its value and add to its popularity already established among those for whom it is intended. Recent work has been incorporated, while other matter has been omitted as calculated to be not entirely in place in a students' handbook. The treatment of nervous syndromes from the physiological viewpoint is insisted on, a feature which is essential if books of this comparatively concise character are to escape becoming mere catalogues of symptoms and signs. R. G. G.

Migraine and other Common Neuroses. By F. G. CROOKSHANK, M.D., F.R.C.P. Psyche Miniatures, Medical series, No. 1. London: Kegan Paul Trench Trubner & Co. 1926. Pp. 101. Price 2s. 6d. net.

THIS little volume consists of a reprint of two lectures, one on "The Psychological Interest in the Common Neuroses," and the other on "Migraine and its Allies." These are readable and interesting, if rather speculative. Intended for the general practitioner, their contention is that some psychical factor is present in every case of organic disease. It is declared, for example, that in migraine and trigeminal neuralgia there is a psychical state which is "characteristic and easily recognisable." The argument would be more impressive were we sure that the author realises the essential clinical difference between migraine and facial neuralgia, and that he has fully weighed the import of the fact that alcoholic injection is a failure in the former and a success in the latter.